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THE LOWER CACHE RIVER BASIN OF SOUTHERN ILLINOIS

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Editor: Mark W Mohlenbrock
Aart-werk Graphic Design, Inc
P O Box 24591
Tempe, AZ 85282

Photography Editor:
Dave E Mueller
Aart-werk Graphic Design, Inc
P O. Box 24591
Tempe, AZ 85282

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Coordinator INPS Flora Update Project:

Dr. Robert Mohlenbrock
Dept of Botany
Southern Illinois University

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Dept of Botany
Southern Illinois University

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TO CONTRIBUTE: See inside back cover for guidelines.

Cover Photo: View of original Cache channel looking east from the Karnak Belknap road; this road crosses on fill placed in the channel to divert the lower Cache water flowing east past the Main Brothers sawmill at Karn

NUMBER 8 JANUARY 1987

THE LOWER CACHE RIVER BASIN OF SOUTHERN ILLINOIS

by Max D. Hutchison[1]

[1] Mr. Hutchison is Field Representative for the Natural Land Institute. This special issue is excerpted from "Lower Cache River Plan", prepared for and funded by The Nature Conservancy through the Natural Land Institute. It is used by permission of The Nature Conservancy.

EDITORIAL

At long last Erigenia 8 has rolled off the presses, and I trust that after reading this issue you will agree that it has been worth the wait. In the pages that follow, we have devoted an entire issue to the unique and fragile Lower Cache River Basin in Southern Illinois. The text of this issue first appeared in a technical report prepared by the Natural Land Institute for the Illinois Nature Conservancy by Max Hutchison, Field Representative for the Natural Land Institute. It is reprinted here in a slightly shortened form. Continued destruction of this habitat would indeed be very unfortunate. After reading this account or after having visited this habitat, one can understand the importance of the preservation of the Lower Cache River Basin for our children and their children yet to come.

I would like to remind our readers of the need for manuscripts to be published in this journal. Erigenia 7 was a milestone issue, in that it was the first issue in which every article printed was unsolicited by the editor. If you have an idea for an article, please feel free to call me at my office: (602) 820-0800.

"Desk Top Publishing" is soon to come to Erigenia. The eminent arrival of a Macintosh Plus computer with a laser printer will enable us to abandon the archaic cutting and pasting method of assemblage of this journal for a more efficient and professional looking journal. Watch for these improvements in Erigenia 9 or 10.

- Mark W. Mohlenbrock

Preface

I have known the Cache River for more than 40 years. As a boy four years of age, I caught my first fish in Dutchman Creek, the stream behind the house where we lived in the early 1940's. When I was five, I sat on a pile of boxes with my sister, high on the dresser in our living room, and watched the flood waters of that same stream rush in the windows and doors of our home. I still remember how my sister's doll swirled around and around as it floated out the front door.

Later, while growing up, we lived several other places in southern Illinois, but we were never very far from the Cache River, or "creek" as we called it. I spent what seemed like endless days in the swamps following my dad as we picked up hickory nuts, slipped on squirrels, trapped for mink, treed "coons", set out bank poles, and swam in the Cache. I can also remember what seemed like endless summer nights, slapping at mosquitoes and trying to sleep in houses without screens.

When I was 12 years old, I thought there was no end to the bottomland forests around Belknap. But, as I wandered a little farther each year, it came to me that the woods and swamps didn't just go on and on. There was a field on the other side of Heron Pond, and somebody did live beyond the "Section 5" woods. This bothered me a little, but still, there seemed to be a lot of "wild" country left.

Then, in the 1950's and 1960's, I watched the bulldozers move in and begin clearing bottomland on a grand scale. It took a while for me to comprehend what was happening. Entire sections of timberland were cleared in a single summer. It was with sadness that I watched cypress swamps like Turkey Pond, where I killed my first fox squirrel, disappear. It was also quite a shock to see how small it looked as a soybean field.

Now, when I try to describe the places I used to roam and play, where I swung on grapevines, caught crawdads, built rafts, stepped on snakes, and "hogged" fish, I realize that most of them are gone. My children don't have the woods to grow up in that I did, and I can't help but wonder what it will be like when they are my age.

It appears that most area residents assume that the changes are inevitable, a necessary part of progress. I don't agree. I believe that we will all be a little poorer when there's little left to see along the Cache but buildings, roads, and cropland. We need to save some of the last remnants of the original wilderness, the forests and swamps that were so much a part of our history, for future generations to learn to know and appreciate.

My objective in preparing this report is to support the current efforts to preserve one of the largest and most significant natural areas in the state, the Lower Cache River Swamps. This wetland is over 3,000 acres and includes a 10-mile segment of the lower Cache River. For many years it has been a noted natural area in southern Illinois, and in several other parts of the state as well, because of its popularity as a place to hunt ducks and catch fish. But, it was not until the 1970's that Illinois scientists really became aware of the area's unique natural features and ecological significance. As continued drainage efforts and land clearing activities threatened to destroy this area, as they had so much of the original swampland in the Cache Valley, concerned individuals began to organize and encourage the acquisition of key parcels of the property by conservation agencies. Many of the private landowners along this part of the Cache have actively supported public acquisition for the purpose of preserving it. A few farmers and local landowners have opposed the preservation efforts because they fear that keeping water in the swamps will hinder farmland drainage.

Some excellent newspaper and magazine articles have been written and several scientific reports have been published that contain good descriptions of the area's character. Among the agencies and institutions sponsoring recent studies that discuss various aspects of the Cache River watershed problems are the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the National Park Service, the Soil Conservation Service, The Nature Conservancy, the Illinois Nature Preserves Commission, the Natural Land Institute, the Illinois Department of Conservation, the Illinois Natural History Survey, the Illinois State Geological Survey, the University of Illinois, and the Citizen's Committee To Save The Cache. With the involvement of so many, it soon became evident that a coordinated plan to guide acquisition and determine long-term management for the preservation of natural areas was needed.

Following discussions among members and staff personnel of The Nature Conservancy, the Illinois Department of Conservation, and

the Natural Land Institute, the Natural Land Institute agreed to prepare a preservation plan for the Lower Cache River Swamps Natural Area. The Nature Conservancy provided funding in the form of a grant to the Natural Land Institute.

This plan is not a "technical report" in the sense that it objectively describes the methodology and results of a detailed scientific study. Most of the general descriptive information is already published and fairly well documented. Its purpose is to provide a better understanding of what is happening in the watershed and what must be done to preserve the natural area as well as to protect all of the natural resources within the watershed. Problems are discussed, needs are identified, and management activities are recommended. A significant product of the effort is the compilation of references and location of data sources.

Many individuals helped me with this report and provided facts, insight, and advice. Ralph Burnett of The Nature Conservancy, Bill Donels of the Illinois Department of Conservation, and Neal Needham of The Citizens Committee To Save The Cache provided extra amounts of help and information. Dr. Scott Yaich of the Cooperative Wildlife Research Unit at Southern Illinois University volunteered time and helped me find much of the background material listed in the reference section. Allen Main of Karnak, Illinois told me a lot about the history of the area. Anice Corzine and his wife Janice of the Citizens Committee To Save The Cache had a vital part in providing data, background information, photographs, and editing. Some personal opinions are included, and some biases are probably obvious, but I have made an honest effort to support my recommendations with documentation to the extent such was practical within the time and cost limitations of the study.

Introduction

There is an unusual valley that crosses the southern tip of Illinois, extending from the Ohio River on the east, to the Mississippi River on the west. It is unique in that it represents the geographical point on the continent where the last invasion of the sea into the Midwest reached its northernmost limit. It is also within a few miles of the southernmost extent of the continental glaciers.

This valley, with its wide flat bottomland, is as large as the valleys of the Ohio and Mississippi nearby, yet it contains no great river. The relatively small Cache River is its major stream, and the valley is commonly known as the Cache River Basin.

This Basin is from one to two miles wide with flat terraces and bottomlands extending as finger-like projections into the bordering hilly areas along tributary streams. Prior to settlement, much of it was swampland, and most of the remaining forest tracts and many cleared farm fields are still annually flooded and poorly drained.

Primarily because of its geographical location and complex geologic history, the Cache River watershed is biologically diverse with a large number of species. It is of special interest to natural area preservationists as it has nearly 60 identified natural areas recognized as being of at least state-wide significance. Three of the largest natural areas are designated as National Natural Landmarks.

The Cache area is primarily rural, and most of the land that is not forested is used for agriculture. It has severe soil erosion and drainage problems that concern farmers, hunters and fishermen, land speculators, and conservation agencies. There has been little coordinated land use planning in the past.

The area of primary concern is the Lower Cache River Swamps Natural Area. It is a contiguous corridor of forested swamps bordering the lower Cache River, nine and one-quarter miles long and averaging about one-half mile in width. It is within the two counties of Johnson and Pulaski, in sections 7, 8, 9, 10, 11, 14, 15, 16, 17, and 18, Township 14 South, Range 2 East, and sections 12, 13, 14, 15, 16, 21, and 22, Township 14 South, Range 1 East of the 3rd Principal Meridan.

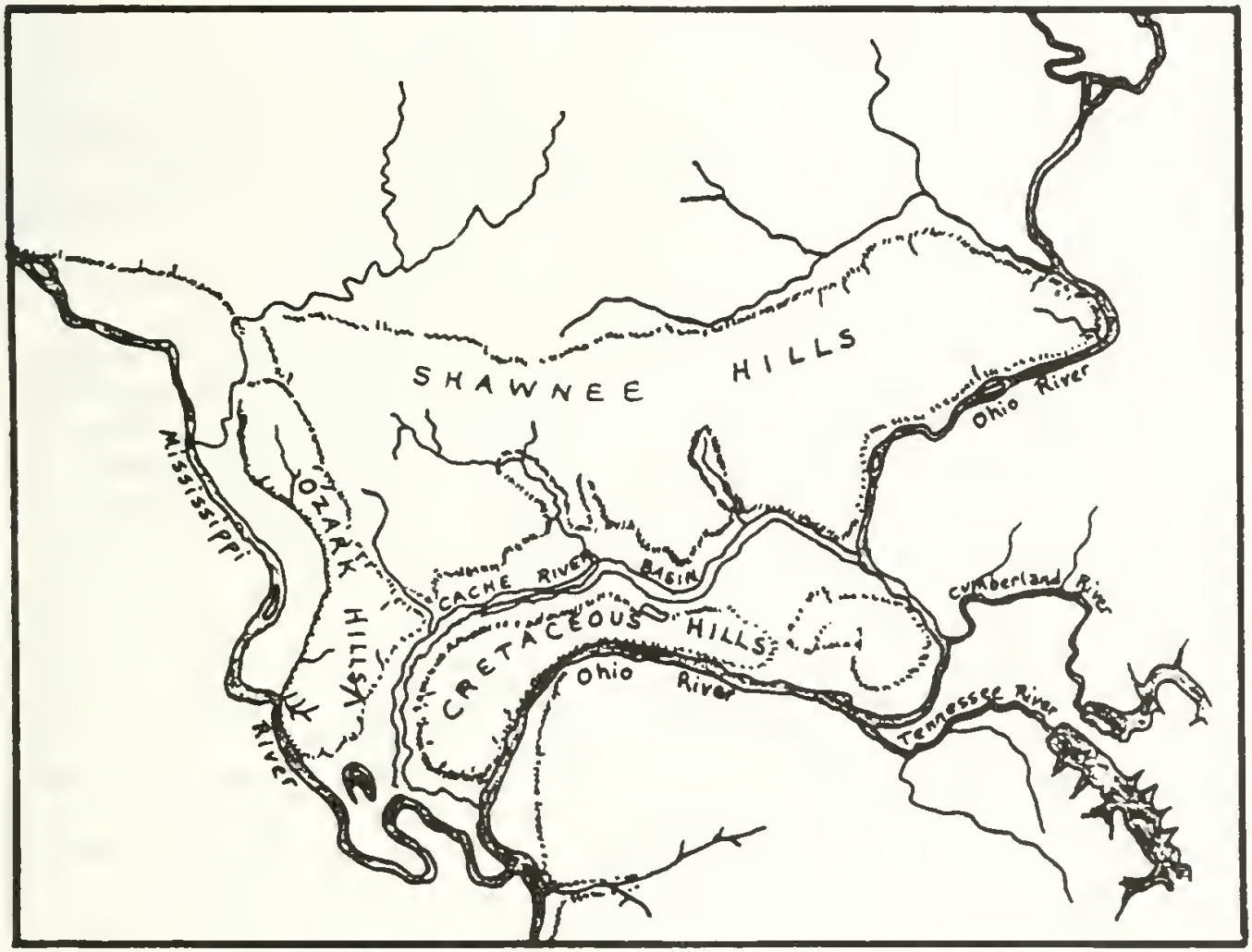

Figure 1. Map of southern Illinois showing major physiographic regions

As this is a natural area of national significance, it is of high priority for preservation. Being a wetland, its character is threatened by both direct and indirect disturbances occuring throughout the entire watershed. Natural versus unnatural changes are often difficult to distinguish, and the basic causes of idsturbing processes are not easy to identify. A special emphasis of this study was to determine what the area was originally like, how the natural processes of the watershed worked prior to 1800, and to document the impact of disturbances since settlement.

During 1984, the Cache River watershed area was observed during different seasons and under varying weather conditions. Long-time residents of the area were interviewed, old maps, photographs, and historical documents were located, and professional individuals who have studied various aspects of the area were consulted. Over 200 written documents were reviewed and referenced. This report is a compilation of facts and interpretations contributed by many individuals, and only a small fraction of the background information gathered is presented.

The initial objective was to find simple practical effective solutions to the problems threatening the quality and very survival of the natural area. This objective was not achieved, and the problems were found to be so complex and long-term, it was difficult during the course of the study to keep from becoming pessimistic about the future of the area. A lot of alternatives were studied and considered. The final conclusion of this report is that the Lower Cache River Natural Area can be saved and managed in a manner that will preserve its significant features, but there will be a cost. As it will be of benefit to the public for generations to come, it is a noble and worthwhile effort worth the cost. The efforts will take time and must have the cooperation of federal, state, and local agencies. To actually be accomplished, the endeavor will also need the support of the public and all of us that are involved. One important fact is evident, time is critical. As each year passes, the problems become more difficult and costly to solve.

Presettlement Character

Geologic History *

Although the Cache River as we know it did not exist until near the end of the Great Ice Age, the general pattern of drainage across the midwestern states was set millions of years ago when the region became lowland between the Appalachian and Rocky Mountains. For eons, rivers from the north, east, and west have met in the Illinois region to flow southward to the sea.

The bedrock formations exposed in the upper part of the Cache River watershed were deposited 500 million to 300 million years ago during Devonian, Mississippian, and Pennsylvanian times. These are sedimentary layers that originated mainly in the marine seas that intermittently invaded the continent.

The Devonian deposits are the oldest, and this part of the Paleozoic Era is referred to as the Age of Fishes. They were originally soluble limestones that have been partly dissolved and replaced by silica, forming thick beds of white chert. This chert was later altered along fractured zones to a powdery substance referred to as tripoli. Toward the end of the Devonian time, there was a great influx of mud, and much shale was formed. The rugged hills along the Mississippi River north of the present site of Olive Branch have narrow ridges and deep ravines and are a part of the Ozark region cut off from Missouri by the Mississippi River. They are formed of Devonian cherty limestones. The part of this upland ridge between Olive Branch and Jonesboro forms the western edge of the modern Cache River watershed.

During Mississippian time, clear, warm, shallow seas invaded the Mississippi Valley. Relatively pure limestones were deposited over enormous areas. South-flowing rivers built deltas into the

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* The geologic information in this section is taken from several sources, particularly from the field trip guide leaflets prepared by the Illinois State Geological Survey (Cote, Reinertsen, & Wilson, 1966; Odum, 1964; Reinertsen, Berggren, & Killey, 1975; Reinertsen, Masters, & Reed, 1981).

sea, much like the present-day Mississippi River delta in Louisiana. This delta front shifted back and forth as the shoreline fluctuated, and the continually changing water depths produced striking, lithological variations that can be seen in exposed cross sections of the formations today. Features such as pebbly zones, ripple marks, crossbedding, and oolitic zones present in the sandstones and limestones indicate that they formed in high energy environments. Regular alternations of sandstone, shale, and limestone formations were laid down, each alternation beginning with a deposition of basal sandstone, then shale, and finally a deposition of limestone. Thin coal seams indicate times when the sea withdrew and plant debris accumulated in freshwater swamps. Mississippian age bedrock is exposed over most of the gently rolling to hilly parts of the upper Cache River watershed. These formations commonly form south-facing cliffs and steep bluffs along the northern margin of the Basin.

During the latter part of the Paleozoic Era, Pennsylvanian seas covered the area and deposited thick layers of sandstones. It was during this period that the coal bearing strata were laid down, most of which have been eroded away in the Cache River watershed area. Pennsylvanian age sandstones cap the high Greater Shawnee Hills ridge that crosses Southern Illinois and forms the northern boundary of the Cache River watershed. These formations are cliff-formers, and because of the general northern dip of the bedrock, vertical south-facing bluffs create a stair-step profile in a north-south cross section. It was during the Mississippian and Pennsylvanian times that the amphibians were prominent and that early land plants became common.

Following Pennsylvanian time, there was considerable movement of the earth's crust. The Ozark area (to the west of the Cache River Basin) was uplifted, and the Illinois Basin (to the north) was depressed. The major faults crossing the area (mostly in parallel lines trending northeast-southwest across southern Illinois and into Kentucky) developed during this time. There was a long period of erosion when the wind, weather, and streams wore down the irregular surface to form a nearly level plain. The low chert hills in present-day Alexander and Union counties were particularly resistant to that erosion and remained higher than the plains to the east.

A bedrock trough, called the Mississippi Embayment Syncline, formed as movements of the earth's crust caused the region between the Ozark Dome (on the west) the Nashville Dome (on the east), and the southern margin of the Illinois Basin (on the north) to subside.

It gradually deepened southward toward the Gulf of Mexico, allowing an arm of the sea to advance northward and inundate the southern tip of Illinois at least twice during Cretaceous time and twice during Tertiary time. This was between 90 million and 20 million years ago. The Cretaceous and Tertiary strata deposited during these invasions filled the Embayment trough and formed a wedge-shaped body of unconsolidated gravels, sands, clays, and silts, that gradually thickened southward (now varying from a thin erosional edge in southern Illinois to more than 3000 feet in Tennessee). These deposits form the low rounded gravel hills south of the Paleozoic bedrock outcrops, and are most prominent south of the Cache River Basin in the present-day counties of Pulaski, Massac, and Pope. The Cretaceous System is a part of the Mesozoic Era known as the age of Reptiles. It was during the Cretaceous that the flowering plants were perfected. The Tertiary System is the earlier part of the Cenozoic Era known as the Age of Mammals. It was during the Tertiary period that the deciduous trees developed, including the taxodiums, ancestors of the modern bald cypress. This period ended between two and three million years ago. As the sea withdrew from this area for the last time, the region was uplifted, and erosion has continued to the present.

The later part of the Cenozoic Era is known as the Pleistocene Epoch, commonly referred to as the Great Ice Age. Beginning about a million years ago, extensive continental glaciers covered northern North America and most of Illinois. There were four major glacial advances, and the third, the Illinoian, reached the farthest south, barely entering present day Johnson County and the northern edge of the Cache River watershed. Early in the Pleistocene, the Ohio River was formed by streams diverted and combined in a westerly course south of the ice front. This was the stream that flowed through the Cache Valley. Outwash, composed of silt, sand, and gravel, was deposited by sediment-laden meltwater streams pouring away from the ice fronts, during both advance and waning of the glaciers. The valleys of the Mississippi and Ohio rivers were greatly enlarged during times of flooding, but during times of little meltwater flow, they became filled with outwash. Near Cairo, deposits accumulated as much as 250 feet thick. Near the end of the last glacial advance, the Wisconsinan, a great melt-water flood caused major changes in the channels of the streams. Most geologists believe that it was during this time, perhaps 13,000 years to 10,000 years ago, that the Ohio was diverted from its course across southern Illinois into a river channel to the south. This left the abandoned Cache Valley to fill with alluvial material to its present level. The Ohio established its present

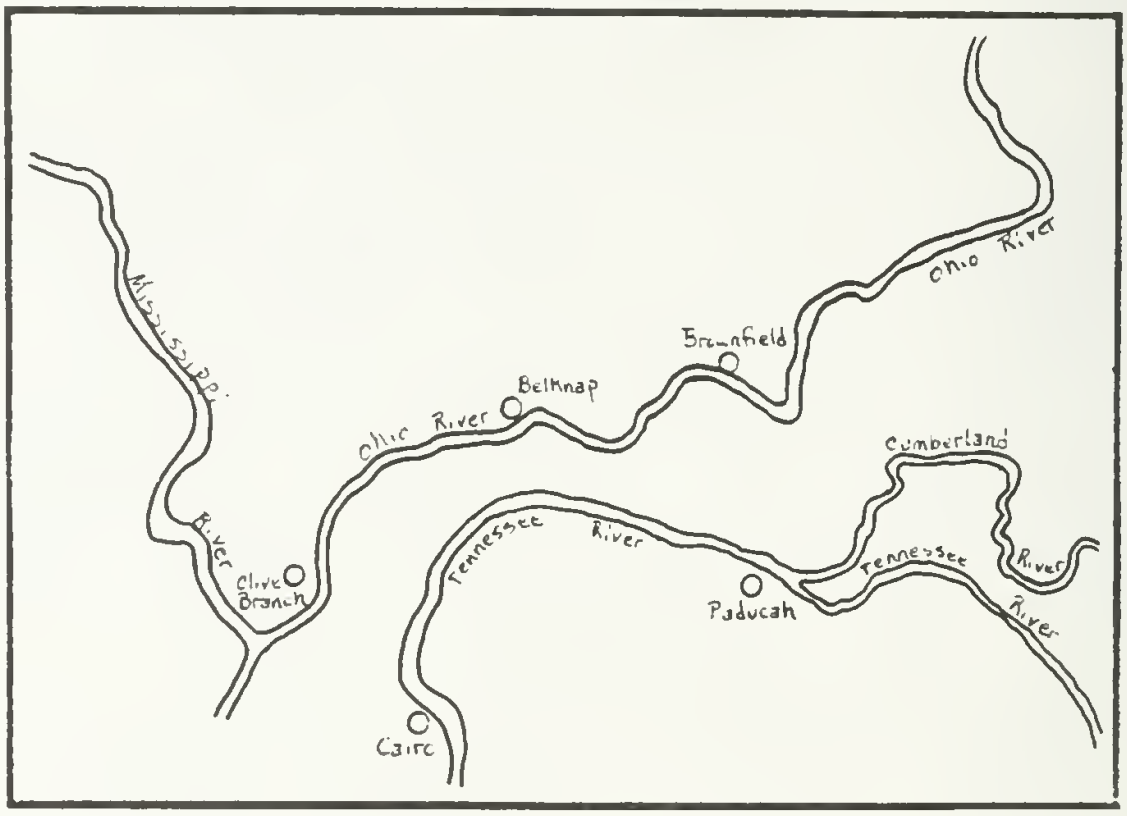

Figure 2. Southern Illinois drainage as it may have appeared during the early part of the Great Ice Age, perhaps 500,000 years ago

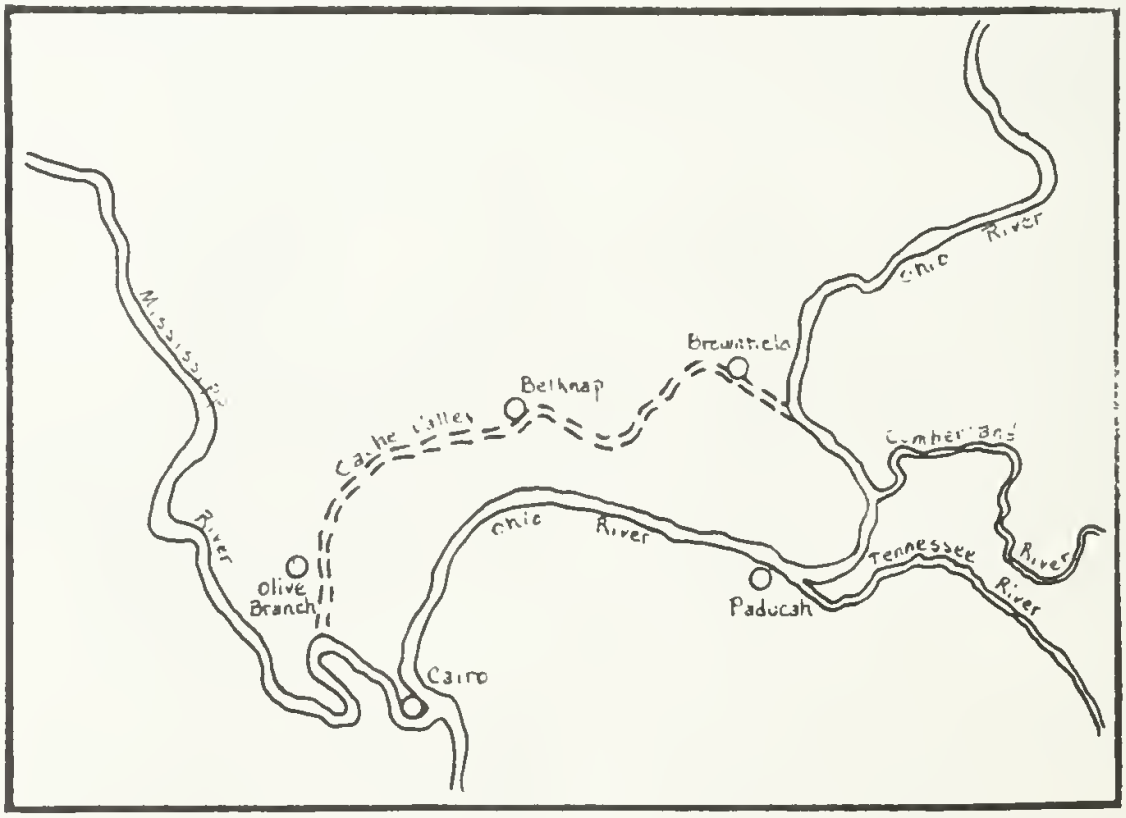

Figure 3. Southern Illinois drainage as it appears at the present time

course in the lower valleys of the Cumberland and Tennessee rivers, but it has continued to occasionally use the Cache Valley as an overflow route, and did so as recently as 1937.

The unconsolidated clays, silts, sands, and gravels that form the low rounded hills south of the Cache River Basin have been reworked by the changing courses of the major rivers and mixed with glacial outwash and recent alluvium.

The upland and terrace soils in the area are also a result of glaciation. Wind-blown silt, called loess, was deposited as a blanket-like cover over the bedrock and alluvial materials in most of the region. This silt came from the floodplains of the Mississippi and Ohio rivers where great dust storms occurred during periods when they were dry. Thicknesses as great as 50 feet are known along the Mississippi Valley, but the loess thins to the east and is commonly less than 15 feet in the uplands of the Cache River Basin. A great deal of the present day alluvium is derived from eroded upland loess.

During the Pleistocene, as the sediment material carried by the glaciers aggraded the Cache Valley, it blocked tributaries forming slack water lakes. The ancestral Cache River was blocked near the present site of Forman to form a lake upstream, and the Little Black Slough-Heron Pond swamps represent a Pleistocene Lake remnant in its waning stages (Graham & Hughes, 1984).

After the Cache Valley was abandoned by the Ohio River, drainage continued to flow westward. The present day Bay Creek was once part of the headwaters of the Cache River system. Gradually, sediment deposited in the Basin by the Cache headwaters formed a whaleback across the Valley near the present site of Reevesville. This low ridge divided the drainage, causing the water to the east to flow that direction into the Ohio near the present site of Bay City. Its main stream is now called Bay Creek.

West of the Reevesville divide, the water continued to flow westward in the Basin. The bottomland sloughs joined with the upper Cache River at a point near the present site of Belknap to form the lower Cache River. It continued to flow west in the Basin and was joined by other streams flowing southward out of the hills to move sluggishly across southern Illinois to near the present site of Tamms. It then turned south, flowing very near one of the Mississippi River bends, thence turned east to enter the Ohio River above the present site of Cairo, about 5 1/2 miles above that river's junction with the Mississippi.

In its primitive state, the Cache Basin was frequently flooded, and thousands of acres were inundated from six to eight months of the year. There were many inlets, especially streams from the upland hills along its north border, but few outlets. There was very little fall, and many of the swamps had no drain, the water simply stood there, partially evaporating during dry periods. High water in the Ohio River often held back the Basin floodwaters and prevented the lower section of the Cache River from draining (Report of Cache River Drainage Commission, 1905).

During the last 10,000 years, there have been changes in climate that affected the Cache River watershed character. Extremely wet periods resulted in accelerated erosion of the uplands. At times, the Basin resembled a huge shallow lake, but it was continually filling in with sediment washed from the adjacent hills. Thick layers of organic debris accumulated in the bottoms of the swamps. During drought periods, the lakes and ponds were reduced in size and much of the swampland was dried, allowing the organic materials at their bottoms to be oxidized. Occasionally overflowing into its old channel, the Ohio River would scour out much of the accumulated silt and debris, and in places the swift currents would wash away stands of trees leaving deep openings to later become linear open ponds. Aggradation exceeded degradation though, and overflows by the Ohio became less frequent. The huge lakes were reduced to relatively small remnants. As the general elevation of the Basin was raised, the water was spread out to create large areas of flat shallow swampland and wet floodplain forest.

Natural Character Just Prior To Settlement *

About 1800, just prior to the time of earliest settlement, probably 80% of the Cache River watershed area was densely forested. There were linear openings along the south-facing bluffs north of the Basin, and prairie glades on bedrock outcrops. Grassy, semi-treeless barrens covered areas of several square miles in size on the gravel hills to the south. In the Basin bottomlands, the swamps, low ridges, and higher terraces were covered with dense stands of timber except

* Most of the information in this section is taken from the eye-witness descriptions of the landscape recorded in the Public Land Survey field notebooks (Public Land Survey, 1804-1850). Some interpretations are based on the present character of natural areas in the region.

where the water was deepest. The prominent wetlands that were more or less open were given names by the early settlers that reflected their natural character, names such as "The Scatters", "Grassy Slough", "Long Reach", "Round Pond", "Cypress Pond", "Fish Lake", "Long Lake", and "Horseshoe Lake". The plant and animal species inhabiting the region were as diverse as the varied types of terrain occurring in the region.

The Cache River began near the present site of Anna in what is now Union County. The small tributaries of its headwaters had rocky beds with many gravel bars. In places, the crooked, high-gradient streams flowed over solid pavements of bedrock and meandered against sheer sandstone cliffs. The waters were almost always clear, but a lot of leaf litter and woody debris was carried downstream during storms to form small temporary dams where it lodged against piles of sandstone boulders. Springs were frequent in the hills along the bases of the bluffs, and they helped maintain a permanent flow in many of the small water courses.

The topography along the upper Cache as it flowed eastward was hilly with lots of rock outcroppings, small cliffs, and sandstone overhangs. This part of the watershed had an upland timber cover of oaks, hickories, ashes, and maples. Beech, tuliptree, and walnut were locally common in the hollows. Larger tributaries had developed small floodplains on which grew tall sweetgums. Runoff was fairly rapid because of the steep slopes, but the water courses were so crooked and choked with rocks and fallen logs, that it often took three or four days for water to get from the upper part of the watershed to the lower Cache in the Basin. The main channel of the upper Cache in this region was commonly about 65 feet wide.

South of the present site of Vienna in what is now Johnson County, the upper Cache River was joined by its largest tributary, Dutchman Creek. It flowed generally south from that point to where it emptied into the Basin near the present site of Belknap. The river flowed through a sizeable swamp before entering the main valley, and the largest pond in this bottom area along it became known as the Little Black Slough. Other swamps and ponds occurred along the Cache upstream as far as the present Union-Johnson County line. Cypress was the dominant tree species in these wetlands. Local sites had dense stands of tupelo, but this species was not so abundant here as in the Basin proper. Other trees common in the low wet woods were swamp chestnut oak, Shumard oak, Shumard oak, kingnut hickory, American elm, swamp red maple, and sweetgum. The main channel of the Cache still

did not average more than 65 feet wide, and at several points, it was less than 50 feet. The river meandered with many hairpin curves, and it was often filled with logs and driftwood that almost dammed its flow. It was continually but slowly cutting across necks of land to form new channels, leaving dead sloughs and oxbows. The channel was generally wide and shallow with a fairly flat bottom and rounded sloping banks. In places, there was some active erosion along the outside banks of steep curves, but under most conditions, the banks were stable and the water had little silt. The swamps and ponds were perched on the banks slightly higher than the bottom of the river channel, but the river usually overflowed its banks several times a year and covered much of its floodplain in this area.

The river slowed drastically once it left the hills and entered the low, nearly level bottomland of the Basin. At a point southeast of the present site of Belknap, it was joined by a sluggish stream from the east, later called the Big Black Slough Ditch. This stream had a watershed that extended fifteen miles (straight-line distance) east to near the present site of Temple Hill in Pope County. Most of its area was low wet swampland, including the largest contiguous cypress-tupelo swamp north of the Ohio River. This swamp, referred to by the early settlers as the Black Slough (or Big Black Slough to distinguish it from the Little Black Slough), covered 11,000 acres. It was variously described at different points by the Public Land Surveyors in 1807 as being a "Lake", a "Pond", "Inaccessible", and as having "water too deep to wade". Some section lines were surveyed on the ice, but several lines were never run. This large swamp was mostly densely forested with cypress and tupelo, but there were a few open areas of deeper water, places that were called by names such as "Long Lake", "Fish Lake", and "Round Lake" by the early settlers. The water never drained nor dried up in this swamp, even during the driest years. During periods of heavy rainfall, the water from upper Cache River would back up into this low part of the Basin (Rolf Survey, 1891-1892).

After receiving the water from the Black Slough Ditch, Cache River turned to flow west in the Basin. Below the present site of Belknap, the channel was divided up into scatters, a braidwork of small channels, ten and twelve feet wide and two to three feet deep. Much of the channel way for a distance of nearly twelve miles (between the present site of Karnak and Ullin) was made up of wide shallow swamps and deeper open ponds. The fall in that distance was less than six inches. That part south of the present site of Perks had one of the two largest areas of open water in the Basin. Local names such as "Long Reach", "Short Reach", "Eagle

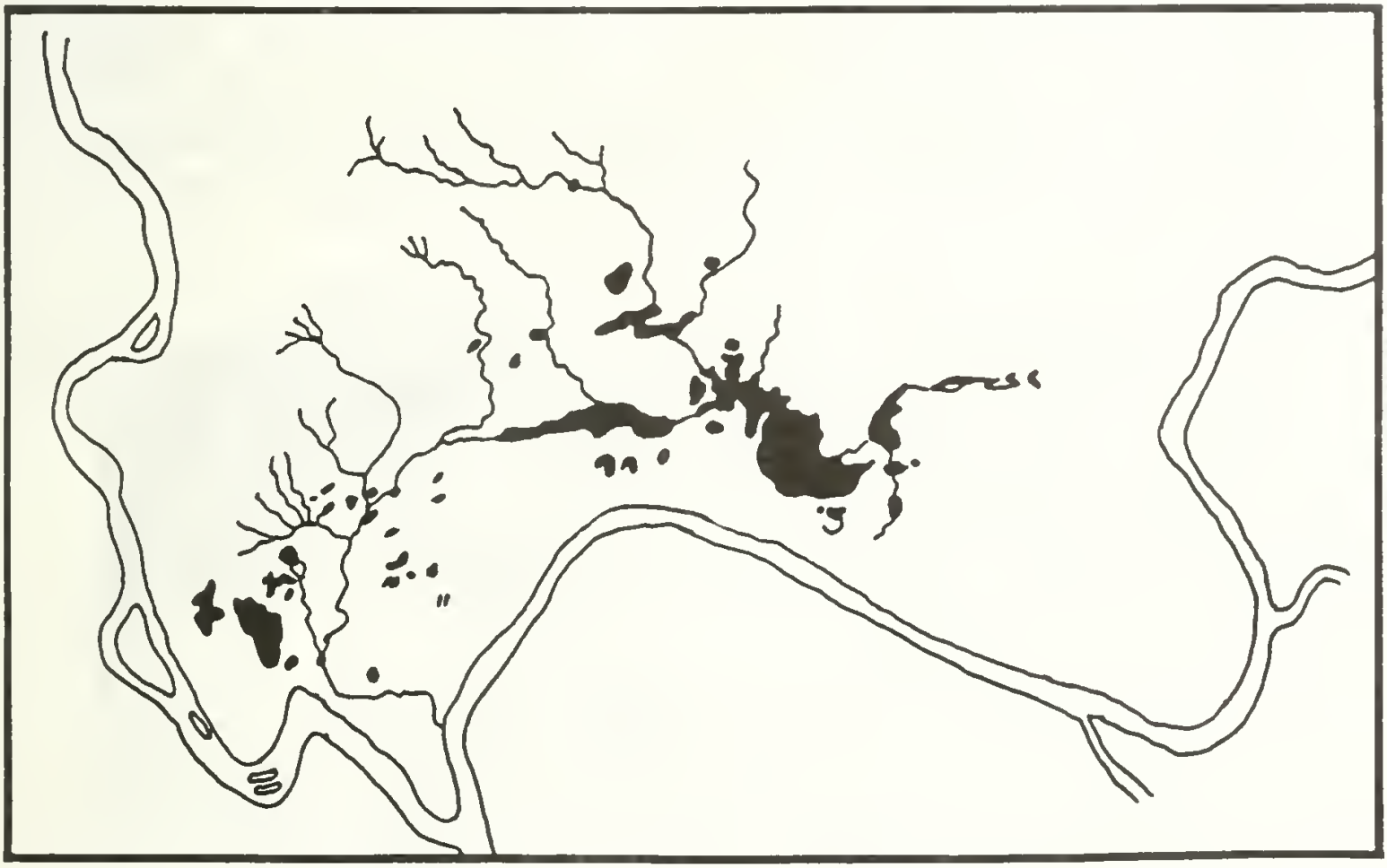

Figure 4. Major "lakes", ponds, and swamps about 1807 as mapped by the Public Land Surveyors in the Cache River watershed; some of the swamps shaded at the very east end probably drained into the Bay Creek system

Pond", and "Goose Pond" were given to different parts of this wetland region by the early settlers. Here, cypress was the dominant tree in the swamps, and there were scattered large individuals in the edges of the ponds where the water was deeper. Trees of all species grew larger in the swamps, on the low ridges, and along the natural levees of the channel ways in this region than in the bottomlands of upper Cache River. Cypress and tupelo trees, four and five feet in diameter were common. Huge elms and swamp maples with widespread crowns made up half the canopy cover and were important members of the wet floodplain forest community (Report of Cache River Drainage Commission, 1905).

Three major tributaries entered the Basin and flowed into the Lower Cache River in this region. The two from the north, Big Creek and Cypress Creek, drained large areas of the Shawnee Hills. They had extensive swamps along their winding channels. The broad wet flatwoods along these streams had some of the finest stands of sweetgum timber in the Midwest. One major tributary entered the river from the south, Limekiln Slough. It had a sluggish flow and drained the extensive swamps along the south edge of the Basin. Here was one of the few places in the Basin where pecan was common.

From an area near the present sites of Ullin and Tamms, the Cache River turned to flow south, developing an extremely crooked course. Swamps and wet woods bordered it in many places and were commonly enclosed by its bends. A considerable amount of spring water flowed into it from sandy seeps and contributed to the river's flow. Two major tributaries, Mill Creek and Sandy Creek, entered the Cache in this region. These streams had their headwaters in the rugged Ozark Hills. Upland timber here was diverse with mesic stands of large tuliptrees and beech trees in the ravines. Slopes were steep but tributaries flowed over wide beds of cherty gravel, and their waters were always clear. There were swamps of 200 to 300 acres along the downstream portions of these tributaries in the Basin.

In the vicinity of Unity, the Cache River was bordered by the gravelly Tertiary hills along its left (east) bank. Here, beech was a common tree in the ravines and small valleys. Scattered huge cypresses grew on the banks of the main stream and along the natural levees of the sloughs and oxbows. To the right (west), a huge bottomland swamp and pond, Horseshoe Lake, covered nearly 3,200 acres. Although the wetland in this area extended westward almost to the Mississippi River, it drained eastward, (by means of Lake Creek), into the Cache. Horseshoe Lake had a relatively large

area of open water. Cypresses and tupelos lined the shallow waters along its edges.

After coming within 1/2 miles of a bend of the Mississippi River, the Cache turned east again, crossed the narrow peninsula above the present site of Cairo, and entered the Ohio River about 5 miles above the Ohio's junction with the Missisippi River. This section was low and swampy with scattered groves and stands of huge cypress trees. There were many abandoned sloughs and oxbows.

Use and Disturbance History

Early Settlement

There are no records to prove just when the first white man viewed the Cache River area, but it was probably before 1670. There is a legend that the Spanish explorer, De Soto, reached southern Illinois as early as 1542 and built a fort on the Ohio River bank, but there is no evidence to prove this. The Ohio and Mississippi rivers provided easier access to the southern Illinois region than to much of the interior west of the Appalachians, and early adventurers commonly used river craft to search for new hunting grounds. The first French explorers to record their visits to the area were Marquette and Joliet. They travelled down the Mississippi River in canoes and passed the mouth of the Ohio River in 1673. They probably did not stop or actually see the Cache River (Bakeless, 1961).

Sometime after 1700, perhaps as early as 1711, the French built a fort along the lower Ohio River. Facts about its construction and early occupation are vague, but it later became known as Ft. Massac. It was the only site of European settlement in the southern Illinois region for many years. There was a settlement established even earlier, but it didn't last long. Charles Juchereau and Father Mermet constructed a tannery and small mission at the head of the "Grand Chain of Rocks" in 1702. It was on a small hill near the present mouth of the Post Creek Cutoff. The tannery was burned, and the 150 inhabitants were all (except for Juchereau who escaped to tell the tale) massacred by the Indians in 1704. The tannery was abandoned until 1812 when a British fort, Wilkinsonville, was built on the site (Moyer, 1944).

Itinerant hunters and trappers were the first white men to actually travel across southern Illinois and paddle up the Cache River. A few knew its paths and waterways quite well even prior to the Revolutionary War, for it was a hunter that guided George Rogers Clark and his little band of soldiers across the swamps and hills of the Cache River watershed on their way to Kaskaskia in 1778. These rugged, half-wild pioneers lived like the Indians. They built no permanent homes, cleared no ground, and left few permanent marks upon the area. It is probable that these early woodsmen depleted certain game species, such as the buffalo, the elk, and the beaver. The Indians continued to use the area as a hunting ground until about 1800. The roving bands found plenty of fuel,

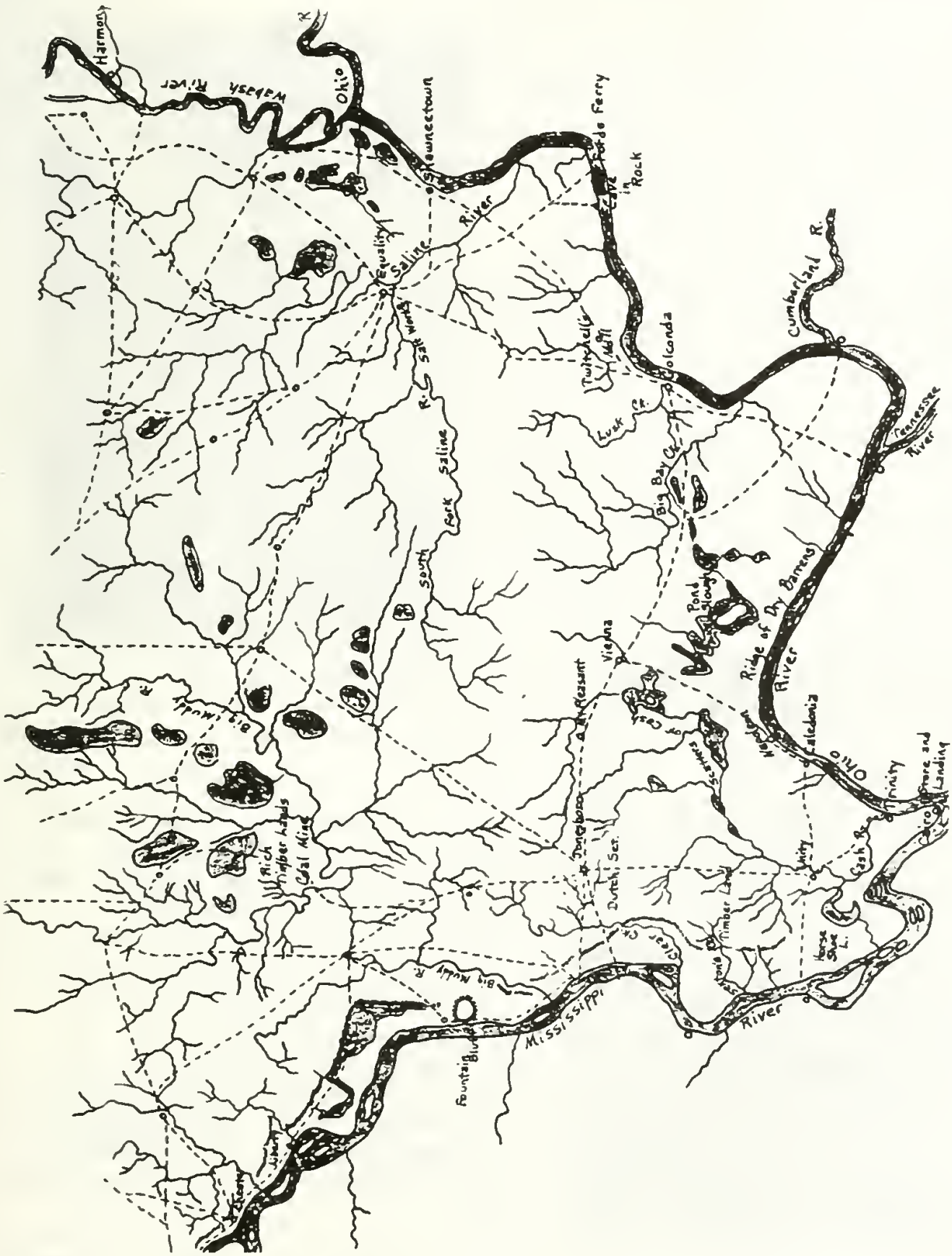

Figure 5. Part of Meish's map of Illinois in 1818

good water, and an abundance of food.

After the Revolutionary War, traffic on the Ohio River increased. Canoes, dugouts, and frail rafts carried hardy explorers downstream to southern Illinois. They were continually searching for more game and fertile new lands. Temporary camps of settlers were established along the banks of the Ohio and a short distance up the Cache River as early as 1795 (Perrin, 1883).

In 1803, two men, Abram Hunsaker and George Packer, came down the Ohio and up the Cache, hunting and fishing. They camped near where Jonesboro now is located in Union County. "The next morning, they killed a bear and a turkey gobbler, and were so delighted with the land of plenty, both of game and excellent water, that they built cabins to house their fanilies and became the first white settlers in the territory" (Perrin, 1883). Government survey crews began to survey southern Illinois immediately after its acquisition from the Kaskaskia Indians in 1803. Their plats and descriptions of the Cache River country provide an eye-witness account of what the region was like prior to significant disturbance. They noted that there were two "dwelling houses" on the Ohio at the mouth of Bay Creek in 1806. In 1795, William Bird first landed at Cairo, but he didn't return to enter land until 1818. A few families were living along the lower Cache River in 1812, for it was that year that all the residents were massacred by the Indians, save one man, who it is said escaped sorely wounded by swimming a wide bayou of the Cache (Perrin, 1883).

Some early land developers seemed always interested in improving boat access by deepening, snagging, and straightening streams. As early as 1819, there was an act of the Illinois legislature to dam the Cache River with the idea of making it a part of the great national highway for navigation. It is not known how much was actually done or how effective it was, but such damming activities met with a lot of local resistance from residents who hated the "miasmatic swamps" and waters which covered much good land. In 1824, two brothers traveled up the Cache from the Ohio River and camped at a spring along it in present day Johnson County. They figured that the river (Cache) would someday be an important stream for riverboat traffic and decided to settle there. They entered two sections of land and the property is still owned by descendents of that family, today (Marshall, 1970).

Although the better drained choice sites were soon settled, it was after 1900 before much of the Cache River bottomland was inhabited. Prior to 1835, most settlers were squatters. They put up a rough

Figure 6. Trees such as this 5-foot overcup oak were a formidable obstacle to the early settlers trying to clear land in the bottoms

Figure 7. Fires from land clearing operations sometimes burned across the swamps during periods of drought, and cypress trees that were hollow were often destroyed

Figure 8. Hollow trees burned like torches, and stumps sometimes smoldered under the ground for weeks

Figure 9. A view of an unchannelized section of the lower Cache between Johnson and Pulaski counties; water elm is the common shrubby tree along the banks; there are no steep eroding banks bare of vegetation

cabin, cleared a few acres for a truck patch, stayed a year or two, and then moved on. Just staying alive was not easy, and farming was basically subsistence farming. As one resident put it, "It was a good country for men and dogs, but powerful tryin on women and oxen." Many of the early residents were migratory, living and farming in the the bottoms after the spring floods subsided, and retreating to the hills to spend the winter. Being from the Appalachians, most were not accustomed to having things too nice and they were fairly content to stay that way. Struggling for mere survival took away most of the ambition they may have had when they got here. Clearing the land was extremely difficult where the forests were dense and the trees were huge. Many became discouraged and moved north to the rich fertile prairie lands where there were few trees to clear and where flood waters seldom destroyed their crops. A lot of the land in the hills of the watershed had thin soils that eroded quickly. Many farms in the Belknap area were worn out and abandoned before the Civil War (Marshall, 1970).

Agricultural activities have been a major disturbance in the watershed area since the time of earliest settlement. Partly because the upland sites were naturally more open (sizeable areas in the Pulaski and Massac County hills were barrens), those places with the thinnest and most erodible soils were frequently settled and plowed first. With little concern for saving the soil, the land was cropped until it washed away or became too poor to grow weeds. It was common practice when one farm wore out to then move to another, or as most farms had some timberland, a new patch of ground would be cleared to till. Farms were small, usually 40 acres or less, and by the 1920's, almost every upland forty in the watershed had a house and barn. A few wealthy landowners cultivated large fields in the bottoms, but the overall percentage of land that was cropped each year was relatively small. One resident at Forman remembered how hard his father worked, year after year, to tend one 15-acre field with a team of balky mules.

By the time of the depression years of the 1930's, the watershed was in bad condition. Many residents abandoned their farms, and those who stayed had little pride or were not able to properly take care of their soil and timber. Livestock, especially hogs, were often allowed to roam the woods. Streams were sometimes full of wallowing pigs on hot summer days. Gullies in fields became so bad, farmers could no longer cross them with mowing machines, and they grew up in bushes and briars. Timber was indiscriminately cut and sold for nearly nothing, sometimes not bringing enough to pay the taxes.

With the conservation programs of the New Deal, the creation of federal agencies such as the Soil Conservation Service and the Civilian Conservation Corps, land care improved. The Shawnee National Forest was created in 1933 and immediately began to buy worn out farmland and cutover timberland in southern Illinois. Their ownership and management improved the condition of the Ozark Hills in the Union and Alexander County parts of the Cache Watershed tremendously.

Still, the most serious agricultural impacts upon the area came after World War II. With the advent of tractors and bulldozers, farming methods changed. Farms became larger, and a greater percentage of the land was row cropped. More marginal land was cleared. Rougher land could be plowed and plowed much deeper than with horse power. Tractors could plow across gullies and small drainageways instead of having to go around. In recent years, the application of chemicals and fertilizers has changed the character of the soils. Weed killers and insecticides are now found in most of the streams. Silt has choked the springs and ditches and filled the swamps.

Farming has also been responsible for introducing many of the exotic plant species now so common throughout the watershed. Problem weeds, such as Johnson grass, have spread into much of the open bottomland in the Basin.

There were sawmills along the Cache as early as the 1850's, but the timber industry really began to boom after 1870, and logging became the most important means of livelihood. Logs were floated from the Big Black Slough swamps from as far upstream as the Enterprise School, about 3 miles south of New Columbia. An extensive network of ditches was dug in the Big Black Slough area to facilitate drainage as well as to provide better routes for floating logs. Main Brothers formed a separate corporation called the Cache River Drainage Corporation, and they did a lot of the ditch work in that area prior to 1920. Many millions of feet of timber were cut along the Cache by the Main Brothers Company until they ceased operation in the 1970's. According to company officials, they cut 2 million feet per year for 20 years in the Big Black Slough area alone. This was mostly softwood, species such as tupelo, sweetgum, tuliptree, cottonwood, and elm. Much of the forest land of the Cache that is left is still composed of groups of young trees filling in between the old oaks and hickories that were left. In general, little cypress was cut, except for local use, because there was little market for it. A lot of big oaks were left along the Cache River banks because they were species that didn't float well. Some

cypress was cut to use as floaters; a cypress log would be "pegged" or "dogged" to a heavier log so that it could be rafted to the mill. A large crew of employees annually cleared the banks, and snagged the main channel and tributaries of the Cache to keep them clear. Logs were cut and piled along the river banks to be rolled in when the water was high and the current just right. A boom across the upper end of the Post Creek Cutoff stopped the logs so that they could be diverted through a gate into the large sawmill pond at the mill site. Logs cut in the swamps were pulled out along "float roads" in long strings of two logs abreast, wired or chained together. In later years, strings of logs a half mile long were pulled out of the Little Black Slough with boats using gasoline engines. Trees in the swamps were normally cut out of boats and occasionally on the ice. Often the stumps would be 6 and 8 feet tall. From the higher ground and low ridges, the logs had to be skidded and piled along the ditch banks to wait sometimes for months for water levels sufficiently high to float them downstream. For many years, oxen were used in the Big Black Slough and Little Black Slough swamps, but from about 1920 on, they were replaced with mules and horses. Loggers set up camps and lived in the woods where they worked. As many as 40 teams of mules were kept at one time and stabled in the woods near Belknap while crews were working the timber in the Bird Springs area. It was after World War II before logs were moved to the Main Brothers mill by truck. Prior to that time, what logs weren't floated, had to be moved by team and wagon, and that was a slow process. Usually, only one log could be hauled at a time (if it were of average size), and a man had to be able to get from the woods to the mill before noon in order to have time to get back and get loaded before night (Main, 1980).

Although some of the larger lumber companies were selective in their logging operations, many were not. It was a general policy not to cut trees on Main Brothers land less than 24" in diameter at breast height, and loggers were instructed to leave one good large tree per acre as a "seed tree". Thus, much of their timber land maintained good stands that continued to produce high volumes even when logged repeatedly. A lot of timberland, though, was not just logged, it was devastated. The practice of only cutting the best (high-grading) gradually left poorly stocked stands that were almost worthless. Land clearing followed logging on most privately owned tracts, and even land worthless for farming was cleared of its timber if the owner could get to it. Large stands of trees were deadened and burned with little effort to salvage the timber. One tract of several hundred acres along the Cache near Belknap was girdled and deadened about 1900. Except for a few hickory removed for wagon

stock, the entire stand was left to die and was then burned. Most of that stand was made up of tall sweetgums, 36 inches in diameter (Orange, 1984).

But it wasn't the logging that was really responsible for the decimation of the Cache River forests, it was the drainage. From the time of earliest settlement, there were men who had high hopes for developing the prosperity of the area, men who envisioned a great agricultural and residential region. They saw that it needed only one thing--drainage. Many spent their lives promoting projects to drain the swamps and bottom lands. In the 1870's, a group of Chicago capitalists studied the feasibility of draining the bottoms in the Belknap area by cutting a ditch straight south to the Ohio River. Even prior to that time, there were local efforts to cut ditches to drain farmland. Sometimes the engineering was less than accurate, and following the construction of a ditch to drain one swamp in Pulaski County, the water ran back from the creek into the swamp instead of the direction desired (Perrin, 1883).

Drainage efforts were particularly encouraged by the Swamp Land Acts of 1849, 1850, and 1860. Under these federal acts, millions of acres of swamp and overflow land in 15 states were conveyed to the respective states to facilitate reclamation of the land for agricultural use. These lands were eventually transferred to the counties to be sold with the proceeds thereof to be used for drainage. Thousands of acres were so transferred to the counties of Pope, Massac, Pulaski, and Alexander. Four drainage districts within the Cache River watershed were in existance prior to 1904, three in Pulaski County, and one in Johnson County near Belknap. Some efforts were made at drainage within these districts, but little real benefits were realized.

In 1903, an act of the Illinois legislature authorized and funded a survey of the Cache River to determine a feasible way to drain and reclaim large areas of overflow lands within its watershed. The results of this survey were published in a report recommending that a cutoff ditch be constructed from a bend of the Cache River near Karnak, straight south to the Ohio River. This ditch was to short-circuit the natural flow and carry the upper Cache water directly into the Ohio by a much shorter and faster route than could be possible by improving the existing channel. The Cache River Drainage District was organized in 1911 to sponsor the project. This work was accomplished between the years 1913-16, essentially as recommended. The ditch partly followed a tributary of the Cache, Post Creek, and it became known as the Post Creek Cutoff. The results of this effort have been dramatic. Gradually,

Figure 10. Looking south along a ditch cut across a low ridge to drain farmland straight south into the Cache, one mile west of Cypress Creek Ditch; photo was taken one year after construction: note bank erosion

Figure 11. Railroads were built across the ponds and swamps, and their embankments modified drainage: originally, there were open trestles a mile or more in length across the lowest sites, but now those are mostly filled; the above view is the Burlington Northern were it crosses Heron Pond

the ditch was deepened and widened by erosion so that it not only carried the upper Cache water, but some of the lower Cache water began to flow backwards into it, as well.

Supplemental drainage work throughout the watershed was accelerated. Swamps and ponds rapidly dried up. The Big Black Slough no longer received the tremendous volume of backwater from the upper Cache, and with a good outlet, it drained alomst completely. Large scale land clearing, tilling of farm fields, and cleaning of stream channels were all activities that concentrated the water flow, increased the runoff, deepened the channels, and contributed to the instigation of severe erosion along the natural and unnatural stream banks. On the upper Cache, crooked sections of the channel were bypassed with ditches.

The lower Cache River, downstream from the Post Creek Cutoff, was directly affected only a short distance by that ditch, but other drainage projects were soon instigated to "improve" that downstream region. Straight ditches were dug to eliminate loops, bends, and curves on the main stream. One of the largest tributaries, Big Creek, was drastically changed by dredging and channel straightening. A straight ditch was cut from a bend in Cypress Creek, directly to the Cache River, causing it to abandon its original longer course. In 1912, channel straightening was initiated along the Cache below Ullin for a distance of nearly two miles. In 1930, the Illinois Division of Waterways began "improvements" which consisted of channel deepening and straightening from just upstream of the mouth of Mill Creek to a point upstream of the mouth of the Boar Creek. The Division also made most of the channel "improvements" along Big Creek and constructed five check dams there in the 1930's. The Illinois Division of Waterways also constructed the channel modifications along Dutchman Creek on upper Cache. Cypress Creek was straightened and diverted by local interests. Federal projects funded the construction of levees to protect the Mounds-Mound City area, and the lower section of the Cache River was cutoff by a diversion ditch into the Mississippi River near Beech Ridge. This channel was constructed in 1950 by the Army Corp of Engineers under authority of the Flood Control Act of 1938. The Corps of Engineers also built the levee from Karnak to Belknap along the Forman Floodway. Work was begun in 1949. This levee cut across the old river channel near Karnak and helped to further divide the upper and lower Cache watersheds. About the time that the Post Creek Cutoff and the Forman Floodway were being constructed (1912-1916), a small earth levee was constructed near Reevesville along the divide between the Cache River and Bay Creek watersheds. In the 1950's, the Corps of Engineers built much higher levees in this area to divide those

basins. Some early dredging work was done between Karnak and Perks placing the spoil on the south bank where it formed a low uneven levee. In section 8, near the old site of Rago, lateral ditches were cut into the Cache to drain the swamps along both sides of the river. In the 1960's, and again in the 1970's, draglines were used to dredge sections of the river from south of Perks, east to Route 37. The timber was cut along the banks in several places to move the machines. The spoil placed along the north edge partially blocked old oxbows such as Short Reach.

Industrial development, other than the sawmills and wood products industries, has had little effect on the Cache River Watershed area. The towns and villages have remained small and have never had large factories.

The railroads have had a great influence upon the area. The Illinois Central was completed to Cairo in 1856. The conrail (or Big Four) was originally known as the Cairo and Vincennes Railroad. It was constructed across southern Illinois, and south to Cairo in 1870-72. The St. Louis, Alton, and Terre Haute line was built through the eastern part of the area in 1888-89. It passed through Big Bay and Reevesville on its way to Metropolis and was later acquired by the Illinois Central. The Chicago and Eastern Illinois line was built in 1900. It passes through West Vienna, Karnak, and Boaz on its way to Metropolis. The Chicago, Burlington, and Quincy Railroad was built between the years 1905-1910. It passes through the Little Black Slough and Heron Pond swamps near Forman. These railroads were a major factor in opening up the country.

The railroad embankments slightly modified drainage in the low flat Cache River bottoms. Although the original tracts had long trestles, the embankments acted as dams across many small sloughs and diverted runoff into larger streams. The Illinois Central embankment helped to divide the Bay Creek and Cache River watershed between Reevesville and the village of Big Bay. The C B and Q track was constructed across Little Black Slough, Heron Pond, and across the broad swamps of the Big Black Slough in the Basin proper.

In building the railroads across the swamps, tracks were laid on crossties held by beams supported by piling driven into the ground. Car loads of dirt borrowed from the nearest uplands were than pushed out on the tracks and dumped to fill beneath the ties and form the solid embankments. The original railroad engineers left long open trestles across the broad sloughs and larger streams, many a mile or more in length. Gradually, railroad maintenance crews filled these with ballast until smaller ones were closed up and the longer

ones were reduced to spans just long enough to cross channels. When the Ohio flood waters crossed the Basin in 1937, these trestles were washed out to very near their original length. The embankments were also damaged at many other places, as well. Railroad trestles often blocked debris and caused huge drifts that impeded natural flows.

Roads have also had an impact upon the natural drainage of the area. For many years, the dirt roads were so frequently wet and muddy, travel was almost impossible during the winter. In the lowest places, great numbers of logs were laid crossways and next to each other to form miles of what were called "Corduroy Roads". Road improvement and maintenance was a constant and continual public activity and expense. Gradually, road beds were raised, bridges replaced fords, and rock material was hauled in to fill the mud holes. In the hills, roads followed ridgetops and drainage divides as much as possible. In the bottoms, roads were often built on levees or next to railroads. In places where roads crossed drainageways and sloughs, the embankments formed low dams to impede the natural movement of water. Culverts and bridge openings were seldom big enough to handle the water flows during times of flooding. Between Johnson and Pulaski counties, the original channel of the Cache was filled with cypress logs and dirt where the Belknap-Karnak road now crosses. The lower Cache water that tended to flow back east, was diverted by means of a ditch along the railroad to flow past the Main Brothers sawmill and on through a ditch (now through culverts under the levee) into the Post Creek Cutoff (Main, 1980).

The natural character has been considerably affected by non-native plants. Aggressive aliens such as Japanese honeysuckle, Johnson grass, and fescue have spread into the forests and natural openings. Pine trees have been extensively planted on National Forest lands in the uplands, and some of these non-native species are spreading into natural communities. Most of the serious agricultural weeds are exotics. In the early days of farming in southern Illinois, crops planted in newly cleared bottomland hardly needed tending. Corn was planted by hand amoung stumps in fields 100 acres in size Yields of 100 bushels per acre were not uncommon on the black rich soils without a single plowing and there were no weeds. Now, there is scarcely an opening anywhere in the area that doesn't have fescue, bluegrass, Johnson grass, honeysuckle, or some other exotic.

Diseases and insect infestations followed settlement that have seriously affected the native vegetational communities. One example is Dutch Elm disease. It has practically wiped out the old elms that were once such an important member of the bottomland forests. It now appears that the sycamore may be headed for the

same fate.

The insects that affect forest trees, such as the epidemics of defoliating caterpillers, may be native but more serious and widespread today without enough natural predators to keep them in control.

An important member of the swamp community today is the beaver. Although it surely did occur along the Cache River prior to the coming of the white man, it was probably not abundant. There are only a few vague references to native beaver populations in the literature, and the species was essentially gone by 1850. Cory (1912) and Forbes (1912) both give references to beaver being in southern Illinois about 1900, but those records refer to observations along the Ohio and Mississippi rivers. In the Cache River watershed, there were probably more beavers on the upland streams where preferred food was more plentiful than in the cypress swamps. It is doubtful that they influenced drainage in the Cache River Basin to any great extent.

Beavers have had a significant impact upon bottomland forests along the Cache since their reintroduction in 1935. They were building dams on Bay Creek as early as 1946, and 1960 they were common along the Cache in the Little Black Slough area. Their dams across the natural drains at Heron Pond raised the low water level in that swamp and caused 20 to 30 acreas of timber surrounding the cypress stand to die. They continue to block drains in the Little Black Slough area, especially at railroad culverts. Several sizeable tracts of timber have been killed in that area. Beaver are increasing in numbers in the lower Cache area. They construct dams to try and hold water in the sloughs, and during dry seasons, they dam the main channel of the Cache at natural drifts or where the stream is silted. During the summer of 1983, their dams helped keep water in the Long Reach and Short Reach areas when the rest of the swampland was dry. Since about 1980, beaver dams have helped maintain water in the swamp at Heron Pond. Here, gullies are threatening to drain the swamp water into the Cache.

Early records are scarce, but there are a few written reports of the native wildlife in southern Illinois to help give us a picture of what it must have been like in primeval times. Joliet and Marquette mentioned that they found geese and ducks at the mouth of the Ohio River, and that they made no effort to fly or swim away from them. They said that the wild turkeys paid them no attention. Jacques Gravier, a Jesuit missionary, said that he saw 50 bears in a single day near the mouth of the Ohio in 1688. Reports such as this were probably exaggerated or unusual, but bears were

evidently common. Several early travelers mention the brightly colored Carolina parakeets in the cypress swamps. Enormous flocks of passenger pigeons roosted and fed in the area, sometimes eating all the mast in the woods. A visitor to the region in 1810 described a willow grove near the mouth of the Ohio "40 acres in extent so filled with pigeons, the branches were broken off and large saplings were bent to the ground." In that same year, Audubon visited an Indian camp at the mouth of the Cache River. He said that they were picking up pecans and hunting swans. Deer were common, although probably not in the numbers that occur in the area today. There were a few elk in the barrens and glades, and there is a report of one being killed in Massac County as late as 1850. The wolves left with the deer, elk, and buffalo, and were about gone by 1900. Cougars were reported until after 1900. An elderly resident (who died in 1984) remembers his father telling of seeing a "panther" in a large tree along the road that now leads to the Heron Pond parking lot. It is difficult to estimate the numbers of squirrels, raccoons, and swamp rabbits, but they must have been common and widespread throughout the region (Bakeless, 1961).

Hunting, trapping, and fishing were serious activities in the Cache River Basin for many years. Valuable fur animals, such as the beaver, mink, and otter, became scarce. The deer and elk disappeared. The few bears, wolves, and cougars that didn't leave with the deer, were hunted to extinction because they were feared and considered to be nuisances. The buffalo were slaughtered for their hides. The Carolina parakeets were shot because they reportedly damaged crops. The passenger pigeons were mercilessly hunted with guns, poisons, and dynamite. The settlers didn't like them because they ate the acorns in the woods, and their hogs starved to death. The large ivory billed woodpeckers, once so characteristic of the cypress swamps, disappeared as the virgin groves were cut down.

Until about 1916, market hunting was legal in Illinois, and for almost 30 years after the coming of the railroads, wild game species were killed, packed in barrels, and shipped from several different depots in the area. The main markets were in Chicago and St. Louis. Ducks and swamp rabbits were the most common commercially hunted species. One man who hunted in the Cache River Basin between 1900 and 1915 said that he usually got 3¢ apiece for big ducks and 2¢ apiece for little ducks. He said that he almost always made more money than those who were working on farms or at the sawmills. On an average day, a hunter in the Reevesville area shot a box of shotgun shells at swamp rabbits. He commonly killed 23 rabbits per box. They brought between 3¢ and 4¢ apiece.

After World War I, the wild game species of almost all species began to decline in southern Illinois. The wild turkey was gone by 1920. The waterfowl populations were more concentrated, and their numbers fluctuated from year to year. Rabbits began to die of diseases, and their numbers dropped drastically. There were still local sites where hunting was usually good, but the days when huntable populations of game species were spread out over the entire region were gone. Soon, hunting became primarily a sport instead of a business. A new type of hunter developed as wealthy businessmen from northern cities came to hunt in the southern Illinois swamps. Railroad companies ran extra trains in the fall of the year to bring hunters from Chicago to the Black Slough area in Massac County. There were dozens of hunting cabins along the Cache in the Long Reach area south of Perks. One owner there rented as high as 40 boats a day. The game laws were not always followed closely, and individual hunters sometimes killed as many as 40 ducks in one morning of shooting. Horseshoe Lake, in Alexander County, was a noted duck hunting area prior to 1928, but after the state constructed a dam to raise the water level, geese began to winter there instead of on the sand bars along the Mississippi River. It soon became known as the "Goose capital of the world". Waterfowl numbers held fairly constant through the 1940's, but during the 1950's, they dropped to alarmingly low populations. The hunting pressure fell off as the game disappeared. Now, there is relatively little duck or goose hunting in the area except near the state regulated refuges at Horseshoe Lake and Mermet Lake.

Many native plants are now rare or becoming scarce. A few, like the medicinal plants, have been depleted by collecting. Digging ginseng for sale was a common summertime occupation for trappers in the Cache area. Now, it is almost wiped out in the area, although a few residents continue to hunt for it every year. Nearly every description of the early vegetation in the Cache bottoms mentions cane. The Public Land Surveyors found canebrakes a mile across. The most extensive were along the lower Cache between Beech Ridge and Mounds. These canes were more than an inch across and grew over 10 feet tall. The original canebrakes didn't last long. Settlers found that where the cane grew thickest, the land was best for farming. Several early writers mention that livestock wiped out much of the cane before fencing laws were passed. Now, the patches that are left seldom seem to do well, and it is difficult to find a cane large enough to make a fishing pole.

The native grasses and forbs that originally grew in the barrens south of the Basin are now scarce. Undisturbed barrens sites are

practically all gone. Species common on the prairies to the north grew in these brushy barrens, grasses such as little bluestem, big bluestem, Indian grass, and wild rye. Forbs, such as blazing stars, sunflowers, and silphiums were characteristic. Cultivation has almost completely wiped out this natural community, but some remnants are still left along Illinois Rte. 45 north of Metropolis.

The willow oak is a rare tree this far north. It was once common south of the Cache River Basin, and a few scattered trees are left in the Mermet area, along the Post Creek Cutoff, and along Limekiln Slough. It has been almost wiped out by land clearing and logging.

Present Character

Landscape

The Lower Cache River Swamps Natural Area is a low depression on the alluvial plain of the Cache Valley, and is within the Coastal Plain Physiographic Province. This valley that extends from east to west across southern Illinois is a prominent and impressive physiographic feature in the Midwest and is probably an abandoned channel of the Ohio River. The natural area includes a section of the Cache River, an underfit stream that now occupies the valley, and is mostly flat with extensive forested swamps and open ponds. Some better drained flatwoods are included in one area north of the river. Here, there are low ridges and shallow swales typical of much of the cleared farmland in the Basin. The natural area boundaries generally follow the edges of the present timber, and in many places these edges also follow the low terraces that border the swamps. The river and its bordering swamps have been pushed to the south side of the broad valley in the west half of the natural area, and Cretaceous gravels that form the low hills to the south overlie limestone bedrock at its south edge. The Cache River is shallow and flat-bottomed with low banks except where it has been deepened and leveed by dredging. In the deepest part of the area, south of Perks, the channel is wider and is bordered by backwater sloughs and old oxbows. There is little fall throughout the area, and water flow is sluggish. Silt is deep in the channels and depressions.

Geology

The Cache River and its bordering swamps within the natural area corridor are mainly bedded in recent alluvium. In places in the valley, these alluvial sediments are 180 feet deep, but in the west half of the natural area, they are not nearly so thick. Mississippian limestone outcrops along the south edge of the natural area near the mouth of Limekiln Slough. Here are several springs that flow into the river from the base of the gravel hills.

Hydrology

The natural area receives most of its water from three tributaries, two that enter from the north, Big Creek and Cypress Creek, and one that enters from the south, Limekiln Slough. Another smaller stream,

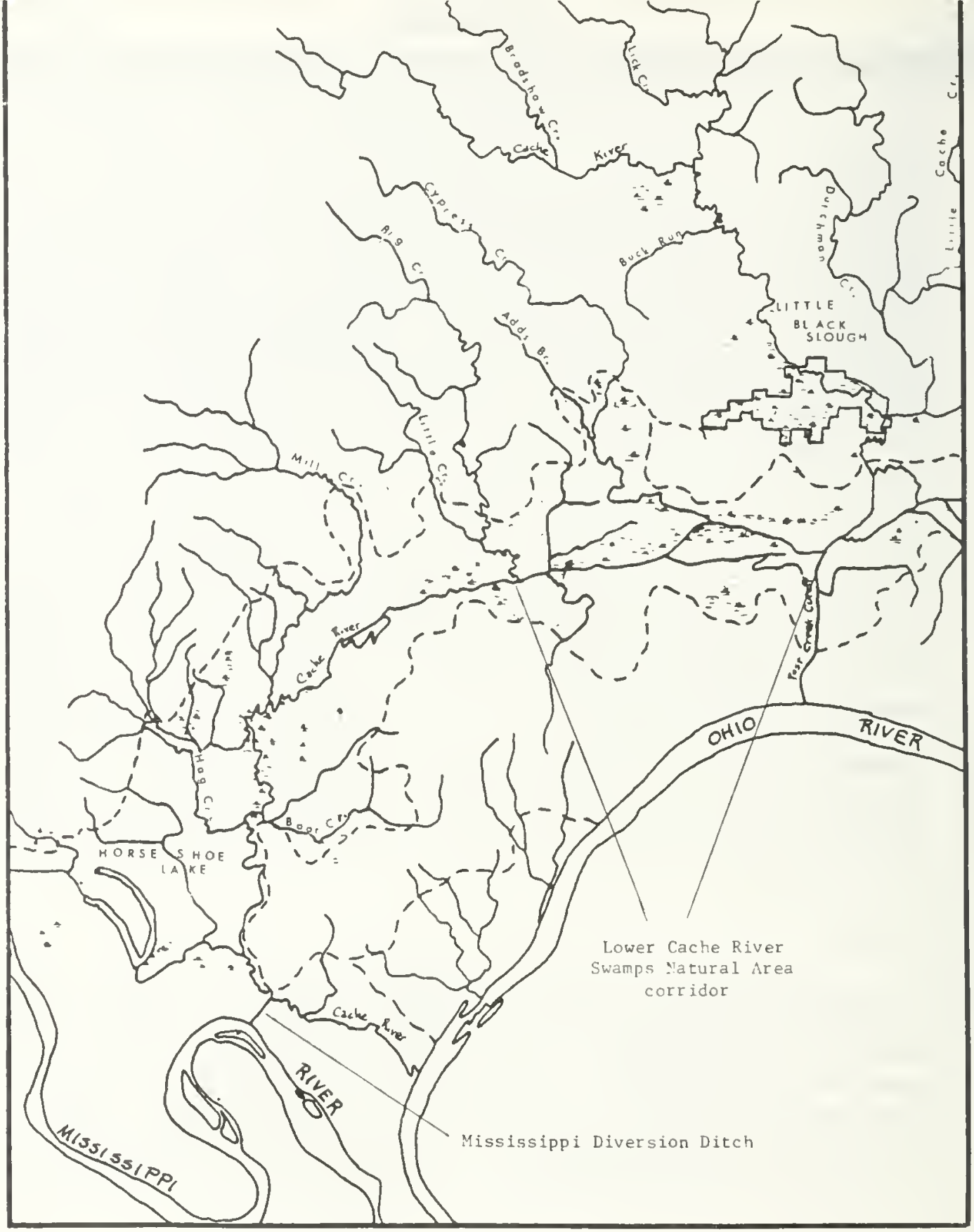

Figure 12. Cache River and its major tributaries showing location of Lower Cache River Swamps in relation to state properties at Little Black Slough and Horseshoe Lake; dashed line is boundary of bottomland

scale· 1 in. = 5 mi.

Kitchell Slough, also drains into the area from the south. Big Creek and Cypress Creek have both been drastically changed by diversions, channel straightening, and dredging in their bottomland sections. Both now empty by shorter routes directly into the Cache River. This part of the Cache Valley is poorly drained because it is low and flat with little fall, and runoff enters much quicker than it can leave. Backwater from the Mississippi River does not get upstream as far as the natural area, but it can get up almost to Ullin and does slow drainage in that direction. Prior to the drastic drainage changes associated with land clearing, channel straightening, leveeing, and the construction of the Post Creek Cutoff, water entering the Basin from upper Cache and its tributaries had long winding courses to follow, and it sometimes took several days for it all to get to the natural area. The straightened sections and cutoffs have now shortened the flows of these streams by many miles. Within hours of the beginning of a rain, water from the uplands is entering the natural area. Water from the hills all the way to Anna (12 miles to the north) rushes down the straightened channel of Big Creek to enter the Cache just west (downstream) of the natural area. At the same time, water is coming down Cypress Creek from nearly as far to enter the Cache near the middle of the natural area. If the rain is general over southern Illinois, Limekiln Slough and Kitchell Slough are carrying water into the natural area section of the Cache. The headwaters of Limekiln Slough have been extensively cleared and ditched in the Brushy Pond area, so that its runoff is also reaching the Cache in much shorter periods of time than it used to. While the tributary watersheds are dumping their loads directly into the lower Cache, upper Cache water is meeting all the runoff from the Massac County part of the Basin (Big Black Slough region) at a point just northeast of Karnak. This water is nearly all carried into the Ohio River by the Post Creek Cutoff, but when the Ohio is high and the Cutoff is full, it can keep the lower Cache water from flowing back into the Cutoff for days at a time. Thus, the only outlet to drain the natural area for extended periods, is downstream along the old channel of the Cache. This part of the river is relatively small, crooked, and choked with drifts, so that it can't begin to carry all the water away as quickly as it enters the Basin, especially when it has the waters of Mill Creek, Sandy Creek, Boar Creek, and Lake Creek to handle as well. With no way for it to flow downstream as it should, Big Creek water runs backwards (to the east) into the natural area. Here, it meets Cypress Creek water, and the currents of both are slowed while the water spreads over the swamps and floodplain. Depending on the Ohio and Mississippi river levels and also upon the varying amounts of rainfall that may have occurred in different parts of the watershed, the water

in the natural area section of the Cache River may flow either direction (east or west), and it may divide at different points. As the water levels begin to fall, Big Creek water primarily goes back to the west to flow on downstream as it should. Most of Cypress Creek water drains backwards to the east into the Post Creek Cutoff. Other factors also influence the direction of flow and division of water at given points. If the swamps and ponds in the Long Reach area are already full of water when a rain begins, less of Big Creek water can flow back into the area. If Long Reach is nearly dry, Big Creek flows east, and Cypress Creek flows west until the low depression is filled. As the water levels drop, the accumulations of silt which form bars at the mouths of the tributaries may also deflect the water one direction or the other. These bars sometimes act as dams to hold some water in the area. In recent years, beaver dams, especially at the mouth of Cypress Creek, have helped to divert the flow one direction or the other. The silt bars and beaver dams are not permanent features and are continually changed by floods.

Spring water flows into the natural area along the south side of the river near the mouth of Limekiln Slough. It is not known just how much water the visible springs contribute. Perhaps more flow is seeping into the swamps below normal water level than from those springs that are visible, and together the amount is substantial. Spring water is especially significant during times of drought, such as during the summers of 1980 and 1983.

During the fall of 1982, a local preservation group, the Citizens Committee To Save The Cache, constructed a low dam across the Cache River in section 15, just west of the Perks Bridge. The Illinois Chapter of The Nature Conservancy provided the funding for the project. The purpose of the dam was twofold: 1) to hold a higher base level of water in the Long Reach swamps area, and 2) to keep out as much of the silty backwater from Big Creek as possible. According to prior observations, silt was accumulating in the lowest depressions in the Long Reach area at the rate of nearly 12 inches per year for each of the six years after the last channel dredging. This channel work had removed the old natural dam across the Cache east of the mouth of Big Creek, and the Long Reach swamps had begun to annually drain and practically dry up during the summer and fall seasons. Thus, when heavy rains came, and the silt laden waters of Big Creek and Cypress Creek (and Limekiln Slough to a lesser extent) rushed down to the Cache, they filled the swamps before moving either east towards the Post Creek Cutoff or west down lower Cache to leave the area. When the currents of Big Creek and Cypress Creek met, and the waters stopped,

Figure 13. A spring flowing from limestone into Limekiln Slough; springs in this vicinity provide an important source of water for the swamps during dry periods

Figure 14. Limestone outcropping along Limekiln Slough south of Cache River; this is one of the few places bedrock is visible in the Basin

Figure 15. Aerial view of Post Creek Cutoff, Ohio River is in upper right; note bank erosion

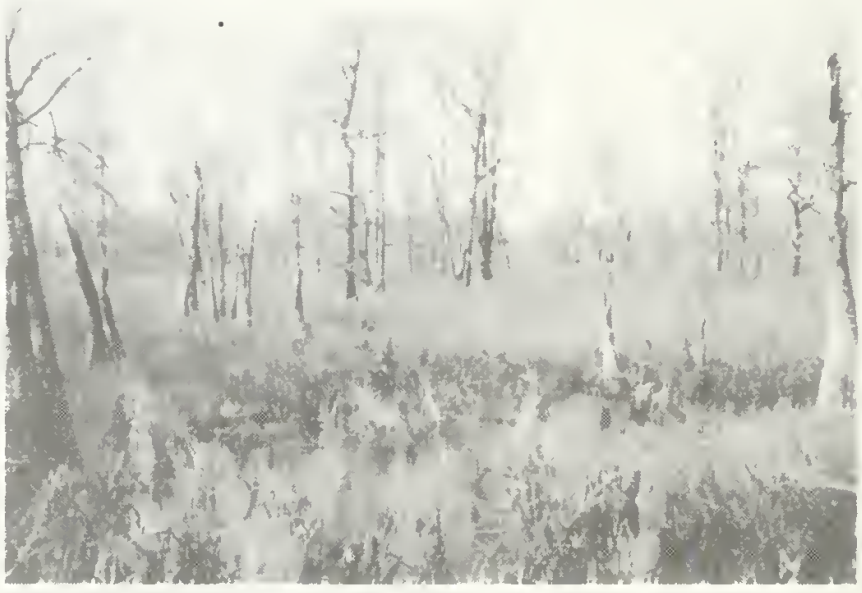

Figure 16. A typical view of the "scatters" north of the river near the Perks bridge: the trees are mostly tupelo; the shrubby layer is buttonbush

for several hours or even days, the silt dropped out in the swamps and river channel. As the Long Reach and Short Reach areas began to fill with silt, willows began to grow in the shallows, especially in the channel bed just east of the Perks Bridge. Buttonbush began to spread into the open ponds and became more dense throughout the swamps. Now, the water in the natural area is much shallower, although its level has not dropped. Because of the lessened water holding capacity of the swamps, and increased flows into the Basin, flood levels are higher now than they naturally were prior to the drainage activities.

During the early 1940's, a lot of hardwood timber died in the natural area swamps along Long Reach. Large old bottomland oaks that were growing on the low ridges and on sites slightly better drained than the swamps apparently died of a common cause. Although all of the factors contributing to the timber kill are not known, it probably was the result of an unnatural drainage change. Big Creek had deposited a silt bar across the Cache just east of its (Big Creek's) mouth. This acted as a dam to hold the low water level higher back up in the Long Reach area. This permanent flooding of the sites that had naturally dried for several months of the year probably killed the oaks. At the same time, silt was also building up in the swamps to help push water levels even higher. When the silt dam was dredged, the swamps went dry faster and more often, and Big Creek water could then run backwards into the natural area more easily. Water level fluctuations became more drastic, and conditions were unfavorable for tree reproduction.

At the present time, there is good evidence that the artificial dam constructed by the Citizens Committee is helping to slow down sedimentation. Measurements of silt accumulations indicate 2 to 3 inches per year instead of 12 inches per year. When the water was high in the fall of 1984, the main channel of the Cache was extremely muddy, but the water in the sloughs and swamps back away from the river was nearly clear. This was obviously because the dam had held enough water in the swamps to keep the silty Cypress Creek and Big Creek water that did get into the area, mainly in the Cache River channel.

Climate and Soils

Southern Illinois has a humid continental climate. The average annual temperature is 58° F, and the growing season varies from 193 to 222 days. Temperatures usually rise above 100° F and fall below 0° F for brief periods each year. The average annual precipitation is 48 inches including between 6 and 12 inches of

snowfall. Severe storms and drastic weather changes are frequent, and rains of 4 to 5 inches are not unusual. The times of greatest flooding usually occur during January, March, April, and May. September and October are the driest months. Average runoff in the Cache watershed is about one-third of the total precipitation (Brigham, 1978; U.S. Army Engineer District, St. Louis, 1984).

The soils on the uplands of the Cache watershed are mainly derived from loess. They have a fragipan, are relatively thin on slopes, and are subject to severe erosion when disturbed. Hosmer, Stoy, Zanesville, Lax, and Alford are typical soils of the hills both north and south of the Basin. Along the upper reaches of the Cache River, Cypress Creek, and Big Creek, the primary bottomland soils are Wakeland and Haymond. Downstream along the upper Cache, the swamp soils are mapped as Sharon and Belknap. The terrace soils along the lower Cache in the Basin are Weinbach, Ginat, and Sciotoville. The swamp and poorly drained soils along the lower Cache are Karnak, Dupo, Belknap, Bonnie, Cape, and Darwin. The natural area soils are mapped as the Karnak-Darwin association. These are light colored and moderately dark colored, fine-textured, poorly drained, slightly acid and medium acid soils. The bottomland soils formed in sediments left from the Ohio River floodplain and in recent alluvium derived from loess washed down into the Basin. Most of the silty soils, both on the uplands and in the bottomlands, are extremely soluble in water and settle out very slowly (Parks, 1975: Parks, 1979; Parks and Fehrenbacher, 1969).

Natural Communities

The Cache River watershed includes parts of three major physiographic regions, and it has a great diversity of plant and animal species. The uplands north of the Basin have dry-mesic forests with a variety of oaks and hickories. There are small but distinct limestone glades on south-facing slopes, and dry sandstone glades occur on ledges of massive bedrock. Narrow bottomlands along the streams occasionally widen and have small swamps of cypress and tupelo. Mesic forests with beech, sugar maple, and tuliptree occur in ravines. Dry ridge tops have dry to xeric forests with post oak, blackjack oak, and farkleberry. White oak and shagbark hickory are common and widespread trees.

South of the Basin, the low rounded gravel hills are commonly dry with post oaks and blackjack oaks dominant. Here, there are a few remnants of the original open grassy barrens that once covered much of the region. Little bluestem and Indian grass are typical barrens species.

On the Ozark Hills, the forests are generally more mesic with beech, sugar maple, and cucumber common. Chestnut oaks occur on the drier ridges north of Tamms, and the yellowwood tree occurs along Wolf Creek north of Olive Branch.

On the low sandy ridges and on terraces in the Cache Basin, there are a few remnants of the original forests left. Here, the finest timber in the watershed grew. In the forests that remain, sweetgum, cherrybark oak, tuliptree, and kingnut hickory are dominants. The original stands had a lot of elm.

In the swamps, cypress and tupelo are characteristic and usually dominant. Many of these trees are huge and old. Individuals have probably stood there for more than a thousand years. Swamp red maple, swamp cottonwood, water locust, and pumpkin ash are also common. Buttonbush and water elm are common shrubs.

The areas of open water, the ponds, usually are bordered by buttonbush and scattered large cypress trees.

The river has been disturbed by channel work in most places, but its natural stretches have large cypresses and dense thickets of water elm and buttonbush along its banks. Cottonwoods and willows commonly grow on the levees. Large grapevines hang from the upper limbs of the trees.

Most of the animals typical of the region occur within the Cache watershed, including a few uncommon species. A variety of fishes, amphibians, and reptiles occur in the swamps. Many are southern species, such as the bird-voiced treefrog, the green treefrog, and the cottonmouth. A southeastern amphibian, the dusky salamander, also occurs in the watershed. Common birds are the chimney swifts, which roost in the hollow cypresses, and the yellow prothonotary warbler. Ospreys and bald eagles are occasionally seen in the winter. Barn owls were recently found nesting in a hollow cypress in the natural area. A few swamp rabbits are left in the bottomlands along the lower Cache and the Little Black Slough area.

Figure 17. The water hickory, Carya aquatica; this is a southern tree that reaches the northern limit of its range in this area

Figure 18. An aerial view of the silt accumulating in the Ohio River at the mouth of the Post Creek Cutoff

Degradational and Detrimental Activities

Soil Erosion and Degradation

A basic problem in protecting wetlands is that they are extremely susceptible to detrimental activities anywhere in the watershed. One of the more common and widespread of such disturbing activities throughout the country is soil erosion. In the Cache River Watershed, erosion of the soils by running water, both on the uplands and in the floodplains, has caused, and is causing, serious problems in the natural area and throughout the Basin.

The hilly upland is where most of the serious agricultural erosion occurs--where the soils in crop fields are left exposed to rainstorms, where stream banks have been cleared of vegetation or trampled by livestock, where heavy machinery leaves ruts, and where ditches and gullies form easily and concentrate runoff. These are estimates of annual soil losses in the headwaters of Big Creek and Cypress Creek exceeding 70 tons per acre. The majority of soil loss occurs during short periods of time, usually during the severest rainstorms in the late fall or early spring seasons. These dramatic losses are not always so obvious, because sheet erosion is spread out over large areas. When a layer of soil only 1/8 inch thick erodes away, the land has lost 20 tons of soil per acre. In 1979, the Soil Conservation Service reported the average soil loss of cropland in Pulaski County was 19.2 tons per acre each year (Stewart, 1979). Not only is a large amount of soil lost by erosion, but it's the best soil, the topsoil that washes away.

Another erosion activity is also occurring along the Cache that is related, but not directly a result of farming activities. This is streambank erosion. Both on the hills and in the bottoms, concentrated flows and fluctuating water levels are causing severe landslides and slumps along the steep banks of Big Creek, Cypress Creek, and the Cache River itself. The basic cause of this type of erosion is the change in longitudinal gradient. As stream courses have been shortened (by channelization, diversions, and cutoffs), their gradients have been steepened. This upsets the natural equilibrium in the watershed and causes the streams to scour their channels deeper, beginning at their mouths and moving upstream. As a channel deepens, the cross-sectional channel gradient is steepened, upsetting the bank stability. The natural armor plate that has developed over many years to stabilize the banks under normal conditions is

destroyed by undercutting.

Erosion is a natural activity. Basically it's the action of weathering agents trying to level uneven topography. Under natural conditions, the erosion activity was relatively slow in the Cache River area. The force of rain falling was checked by a dense forest canopy. Runoff was slowed by a thick layer of leaf litter. Stream flow was checked and dispersed by logs, litter, and debris that formed drifts and dams. Shallow streams overflowed frequently but slowly along low level banks, and there were wide floodplains to hold the water until it could be slowly released to reenter the stream. The land surface, even on slopes and along stream banks, slowly hardened and developed an armor-like cover. This armor plate protected the soil from being loosened and eroded under normal weathering and flooding conditions. There were occasional severe storms and long wet periods when local sites would erode, but the process was never widespread enough to upset the equilibrium that had developed, and these sites had time to heal and become re-vegetated. Since settlement, unnatural changes in several parts of the process have disturbed the entire systems equilibrium, and it will take a hundred years or more for a stream the size of the Cache River to adjust to a new set of conditions.

Sedimentation

The product of upstream erosion in the watershed is sedimentation in the natural area wetlands. The soil that's washed from the agricultural hill land and that is eroded from the ever widening stream banks is dumped directly into the Cache River channel by means of diversion ditches and straightened channels along Big Creek and Cypress Creek. Their waters are nearly always muddy. Here in the natural area, the currents are slowed because there's no outlet to remove the water as quickly as it can enter. As the water slows and virtually stops, much of the silt settles out. This part of the Cache never has enough current to remove the silt accumulation from the area, although a certain amount of it is re-dissolved and moved around during times of flooding. The ponds and swamps are filling rapidly, and even the Cache channel silted full in six years after being dredged six feet deep. This sedimentation has encouraged the establishment of willows in the channel and the spread of buttonbush in the swamp openings. It is probably partly responsible for the death of old oak trees that once grew along the swamp edges.

Pollution

Associated with the sediment load that is periodically dumped into the natural area, certain other pollutants are also a threat to

the integrity of the natural area. Runoff from agricultural land does carry fertilizers (nitrogen and phosphorus), chemical weed killers, and insecticides into the swamps. It is not known what detrimental effects these are having upon the vegetation and overall water quality, but such may become even more serious in the future.

Flooding

Flooding has always been a common occurence of primary concern to local residents in the Cache River Basin. The area naturally had poor drainage, and many hundreds of thousands of dollars have been spent over the years in efforts to drain it. During exceptionally dry years, more swamp land is invariably cleared by farmers still hoping to increase their crop land acreage. The more wet land that is cleared and put into production, the greater the flooding problems appear to be. The simple truth is that until the climate changes, the Basin will always have the same amount of water to handle as it did in presettlement times. Now that the streams have been channelized and leveed, and there are no longer huge natural swamps to hold the flood water, it either has to be transported quickly to the Mississippi and Ohio rivers, or it has to spread out over farmland. It is not as simple as it may seem to get rid of the water by simply digging straight ditches, such as the Post Creek Cutoff. In trying to solve one problem, others are created. As the water is carried at greater velocities, erosion, especially bank erosion, is accelerated. This erosion tends to affect the entire watershed, all the way upstream to the head of every tributary. The ditches must carry tremendous amounts of silt which settles in the ditches where the grades are gentle. The silt must be continually dredged to keep the ditches open. When the currents are great enough to keep the ditches free of silt, the banks erode drastically. The ground water levels are lowered, and droughts are more severe. Thus, some landowners may appear to benefit by draining swampland, but others lose land due to sedimentation and erosion. And all landowners in the drainage districts help pay for the construction and maintenance activities in the form of drainage taxes.

Loss of Water in Natural Wetlands

A serious problem in maintaining the natural swamps is keeping water in them. Almost every land use "improvement" in the area since settlement has been designed to drain the wetlands. Dredging, ditching, and the removal of drifts probably have not reduced flood levels much, but they have (with the help of sedimentation filling the depressions) caused the swamps to dry up during periods of

little rainfall.

Swamps need water to keep them swamps and to distinguish them from wet floodplain woods. Swamps and ponds that naturally were flooded 6 to 8 months of the year rapidly change when drained. Young trees and shrubs of several species move in and become established. Weeds and vines frequently thrive, including exotics if there are seed sources in the vicinity. Native plants that are adapted to a water environment die or are crowded out. Fish die, and many amphibians and reptiles have to leave or are subject to extreme predation. Larger animals also suffer. The last native flocks of wild turkeys in Illinois survived until 1920 in the Cache River swamps. They could fly to the low ridges when flushed and be well protected from man and predators by the sloughs. After the swamps were drained, they quickly disappeared.

The lack of sufficient water in the natural area ponds and swamps has caused some rather extensive fish kills particularly during the early 1980's. Shrubby vegetation is filling in a lot of swamp areas that used to be open water. Some exotic species have become established. The low dam constructed by the Citizen's Committee To Save The Cache in 1982 has helped to maintain a higher low water level in the Long Reach area than was previously the case.

Declining Populations of Plants and Animals

Most plants that originally occurred in the natural area are probably still represented, but certain ones are reduced in numbers. Selective logging has removed many of the large overcup oaks that used to be so common on the low ridges in the area. The willow oak, a rare tree in Illinois, was probably fairly common prior to land clearing activities, but now, there are only a few individuals left along Limekiln Slough. Throughout the Basin, the cypress and tupelo stands have been greatly reduced in numbers and size, and few old trees are left outside of the natural area. The pecan originally occurred in Brushy Pond along the headwaters of Limekiln Slough, but now there are few native trees left.

Animals have suffered to a greater extent. The larger mammals that originally occurred in the Basin and watershed area, such as the buffalo, elk, cougar, black bear, and wolf, are now gone. There are still a few bobcats and otters that occasionally move through the area, but they are rare. The swamp rabbit occurs but is scarce. The passenger pigeon, ivory billed woodpecker, and Carolina parakeet are totally extinct. The American egret was once common but now probably does not occur in the watershed. Bats are apparently less

common now throughout the area than they were 100 years ago when certain species commonly frequented the large hollow cypress trees.

Loss of Natural Vegetation and Wildlife Habitat

The primary reason for the destruction of the forests and wildlife habitat has been land clearing for agricultural purposes. The best land in the watershed was cleared early, but marginal land on rocky slopes and in wet swamps is still being bulldozed to make more cropland. During the exceptionally dry years of the 1960's and 1970's, hundreds of acres of swampland were cleared along the Cache River between Karnak and Ullin. Much of this land is still too wet to farm, but landowners continue to try, sometimes getting soybeans planted, but seldom being able to harvest them.

Land clearing essentially eliminates native vegetation from a site and changes its value for wildlife. Certain species of birds are attracted to open cropland and to cleared land that is seasonally flooded, but the native forest species are essentially gone.

In the natural area, a tract of nearly 200 acres was cleared in the 1970's. It was replanted in trees, but flooding has killed many of the young saplings. About the same time, a tract of about 120 acres was cleared by a farmer in section 16, at the west end of the natural area. It has mostly been too wet to cultivate, and a lot of it is growing up in weeds and brush. Around 1980, about 80 acres were cleared in sections 7, 8, and 18, just south of White Hill. This property is now owned by the State and is being allowed to revert to forest.

Exotic Species

Exotics are common throughout most of the Basin and non-native plants and weedy species have been introduced into parts of natural area by land clearing, agricultural activities, and the drying of the swamps. Japanese honeysuckle occurs in several places along the swamp edges. Some common weeds occur near the hunting cabins. Considering the natural area as a whole, exotics are not yet serious and present no real threat to its natural integrity at this time.

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Each manuscript received by the editor will be sent out for review to one (or more) of the members of the editorial review board. Authors will be notified of any revisions judged necessary and will, if necessary, have the manuscripts returned for revision. The editorial staff reserves the right to reject any manuscript which does not comply to the above guidelines.

Contributors are also needed to submit book reviews to be published in the journal. Please inform the editor of the title wished to be reviewed prior to submitting it. Guidelines are the same as above except no biographical sketch is needed and the review should not exceed one page in length.

As a special service, floristic studies and related topics of areas in Illinois and the states which border Illinois will be accepted for publication. Guidelines are as those for above manuscripts except that plant lists are to be typed in double columns with ½ inch margins around the page. (Plants lists shall be printed in a slightly reduced form.)

Copy ready manuscripts and/or questions concerning publication should be sent to:

Mark W. Mohlenbrock
Editor - **Erigenia**
P. O. Box 24591
Tempe, AZ 85282

Illinois Native Plant Society
Dept. of Botany SIU-C
dale, IL 62901