LEVEL III AND IV ECOREGIONS OF ILLINOIS

by

Alan J. Woods[1]
James M. Omernik[2]
Charles L. Pederson[3]
Brian C. Moran[4]

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[1]Department of Geosciences, Oregon State University
U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory
200 SW 35th Street
Corvallis, Oregon 97333

[2]U.S. Geological Survey
U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory
200 SW 35th Street
Corvallis, Oregon 97333

[3]Department of Biological Sciences, Eastern Illinois University
Charleston, Illinois 61920

[4]Indus Corporation
U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory
200 SW 35th Street
Corvallis, Oregon 97333

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INTRODUCTION

Ecoregions denote areas of general similarity in ecosystems, and in the type, quality, and quantity of environmental resources. They are general purpose regions that are useful for structuring and implementing ecosystem management strategies across political boundaries (such as state lines) and across agencies (Omernik and others, 2000). Ecoregions stratify the environment according to its probable response to disturbance, and recognize the spatial differences in the capacities and potentials of ecosystems (Bryce, Omernik, and Larsen, 1999).

Ecoregion frameworks are useful for 1) inventorying and assessing national and regional environmental resources, 2) setting regional resource management goals, 3) establishing geographical research frameworks, and 4) developing regional biological criteria and water quality standards (Arkansas Department of Pollution Control and Ecology, 1988; Bazata, 1991; Environment Canada, 1989; Gallant and others, 1989; Heiskary and Wilson, 1989; Hughes, 1989b; Hughes and others, 1987, 1990, 1994; Larsen and others, 1986; Lyons, 1989; Ohio Environmental Protection Agency, 1988; Plotnikoff, 1992; Rohm and others, 1987; U.S. Environmental Protection Agency, Science Advisory Board, 1991; Warry and Hanau, 1993; Whittier and others, 1988).

Ecoregion frameworks have been developed for several countries, including the United States, Canada, New Zealand, and the Netherlands (Bailey, 1976, 1983, 1995; Bailey and others, 1985, 1994; Biggs and others, 1990; Ecological Stratification Working Group, 1995; Klijn, 1994; Omernik, 1987, 1995a; Omernik and Gallant, 1990; U.S. Environmental Protection Agency, 2005; Wiken, 1986). The first compilation of ecoregions in the conterminous United States by the U.S. Environmental Protection Agency (U.S. EPA) was performed at a relatively cursory scale (1:3,168,000), and was published at a smaller scale (1:7,500,000) (Omernik, 1987). Subsequently, this ecoregion framework was expanded to include Alaska and all of North America, revised, and made hierarchical (Gallant and others, 1995; Omernik, 1995b; U.S. Environmental Protection Agency, 2005).

Level I is the coarsest level in the ecoregion hierarchy; it divides North America into 15 ecological regions. Level II divides the continent into 50 regions. At level III, the continental United States contains 104 ecoregions, whereas the conterminous United States has 84. Level IV ecological regions are further subdivisions of level III ecoregions. The exact number of ecological regions at each hierarchical level is still changing slightly as the framework undergoes development at the international, national, and state levels.

Detail resolution on Omernik's (1987) ecoregion map of the conterminous United States was necessarily limited by its rather small scale of 1:7,500,000. Subsequently, many larger scale, collaborative, state projects refined Omernik's original ecoregion map, and subdivided its level III ecoregions into level IV ecoregions. Completed level IV ecoregion projects cover Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, Missouri, Montana, Nebraska, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. Other state level IV ecoregion projects are still in progress including Minnesota, New Jersey, and New Mexico. These level IV ecoregion projects have involved state agencies, U.S. EPA regional offices, and the U.S. EPA–National Health and Environmental Effects Research Laboratory, Western Ecology Division in Corvallis, Oregon. Projects have included participation by the U.S. Department of Agriculture–Natural Resources Conservation Service and the U.S. Department of Agriculture–Forest Service as part of an interagency effort to develop a common framework of ecological regions.

In this paper we refine the level III ecoregions of Illinois, subdivide them into more detailed level IV subdivisions, and provide descriptions and summary information for each ecoregion in the state. Illinois has 6 level III and 25 level IV ecoregions; all but 8 continue into ecologically similar parts of adjacent states (Chapman and others, 2001, 2002; Griffith, 1994; Omernik and others, 2000; Woods and others, 1998, 2002).

The work in Illinois was done in cooperation with U.S. EPA Region 5. The Illinois ecoregionalization project involved personnel from several state agencies, federal agencies, and universities, including the Illinois Environmental Protection Agency (Illinois EPA), Illinois Natural History Survey, Illinois State Geological Survey, Illinois State Water Survey, U.S. Department of Agriculture–Natural Resources Conservation Service (NRCS), and Eastern Illinois University. This project was partly conducted under the auspices of the Program for Cooperative Research on Aquatic Indicators Award # CR-831682-01.

The procedures used to define Illinois ecoregions are consistent with those that were used in preceding U.S. EPA ecoregion studies of neighboring states (Chapman and others, 2001, 2002; Griffith, 1994; Omernik and others, 2000; Woods and others, 1998, 2002). They are based on the premise that ecological regions can be identified through the analysis of biotic and abiotic characteristics that affect or reflect differences in ecosystem quality and integrity (Omernik, 1987, 1995a; Wiken, 1986). Spatial pattern, composition, and spatial correspondence of physiography, natural vegetation, soil, surficial and bedrock geology, climate, land use, land cover, wildlife, and fish

were considered as part of the process. The relative importance of each biotic and abiotic characteristic varied from one ecological region to another regardless of the ecoregion hierarchical level. Expert judgment was employed throughout the selection, analysis, and classification of data to define the ecoregions. Information from the literature and input from state and regional experts were very important to this project, as well as the earlier ones in neighboring states. Ecoregion lines were compiled at 1:250,000-scale onto 1:250,000-scale topographic base maps. More detailed explanations about the methods, materials, rationale, and philosophy for the ecoregionalization process can be found in Gallant and others (1989), Omernik (1995a), and Omernik and Gallant (1990).

Evaluation of the ecoregion framework presented in this paper is a necessary future step. U.S. EPA ecoregions have been evaluated extensively in the past, and the most meaningful of these efforts have involved the use of measures of water quality and indices of biotic integrity (IBI's) (Hughes, 1989a; Larsen and others, 1986, 1988; Whittier and others, 1987; Yoder and Rankin, 1995). A better tool would be a more encompassing index of ecological integrity (IEI) (Omernik, 1995a, 1995b); although an IEI is not available yet, there is considerable interest in at least two states to begin its development. Verification of ecoregions cannot be done by considering individual ecosystem components; this is because the ecoregion framework was not intended to show regional patterns specific to either the flora or fauna of terrestrial ecosystems, nor was it intended to reflect distributions of fish or aquatic macroinvertebrates.

PRIMARY SOURCES FOR ILLINOIS ECOREGION INFORMATION

The Illinois ecoregion delineations are based on several criteria: 1) physiography, 2) natural vegetation, 3) soil, 4) surficial and bedrock geology, 5) climate, 6) land use and land cover, and 7) regional biogeography. Primary sources for ecoregion delineations, descriptions, and summary tabular information are listed below. A list of references is also included in this report. Small scale maps of Illinois' physical and cultural attributes are available from Fehrenbacher and others (1967), Horsley (1986), Neely and Heister (1987), Nelson (1978), and Schwegman (1973).

1) Physiographic information was gathered from Bier (1980), Dahlberg and others (1985), Fenneman (1938), Fryxell (1932), Hammond (1970), Leighton and others (1948), Neely and Heister (1987), Nelson (1978), Schwegman (1973), Summers and others (1980), and both 1:100,000- and 1:250,000-scale topographic maps.

2) Natural vegetation information was obtained from several sources, including Gleason (1910), Neely and Heister (1987), Schwegman (1973), Summers (1980), Szafoni and others (on-line resource), Vestal (1931), Winsor (1987), and Wright (1968). Potential natural vegetation information came from Kuchler (1964).

3) Soil information was gleaned from many sources, including Fehrenbacher and others (1967, 1968, 1978), Mausel (1969, 1970), the State Soil Geographic (STATSGO) digital map (Natural Resources Conservation Service, no date), official soil descriptions (Natural Resources Conservation Service (on-line resource), county soil surveys (Natural Resources Conservation Service, various dates), Nelson (1978), Schwegman (1973), and Thorp (1968).

4) Surficial and bedrock geology information came from Illinois State Geological Survey (2000), Lineback (1979), county soil surveys (Natural Resources Conservation Service, various dates), Nelson (1978), Richmond and Fullerton (1983, 1991), Richmond, Fullerton, and Christiansen (1991), Richmond and Weide (1993), Schwegman (1973), Weibel and Panno (1997), Willman and Frye (1970, 1980), and Kolata (2005) (supersedes Willman and others (1967).

5) Climate information, including growing season, precipitation, and temperature data for the 1971-2000 time period, came from the Illinois State Climatologist Office (on-line resource).

6) Land use and land cover information came from several sources, including the land use classification of Anderson (1970), the 2002 Census of Agriculture (National Agricultural Statistics Service (on-line resource), county soil surveys (Natural Resources Conservation Service, various dates), the 1991-1995 land cover atlas by the Illinois Department of Natural Resources (on-line resource "a"), the seasonal land cover map by Loveland and others (1995), and the land cover map by Luman and others (2004) (supersedes Luman and others (1997).

7) Regional biogeographic information was derived from sources including Keys and others (1995), McMahon and others (2001), Neely and Heister (1987), Schwegman (1973), Smith (1971), Summers and others (1980), Vestal (1931). Distribution maps for Illinois flora and fauna came from the Center for Biodiversity at the Illinois Natural History Survey (Illinois Natural History Survey, on-line resource). Lists of threatened and endangered species in Illinois came from the Illinois Endangered Species Protection Board, Illinois Department of Natural Resources (Illinois Department of Natural Resources, on-line resource "b").

In addition, information also came from collaborators including Candice Bauer (U.S. EPA), Bill Ettinger (Illinois EPA), Gregg Good (Illinois EPA), Ed Hammer (U.S. EPA), Mark Joseph (Illinois EPA), Don Keefer (Illinois State Geological Survey), Laura Keefer (Illinois State Water Survey), Andrew Phillips (Illinois State Geological Survey), Don Pitts (NRCS), Mike Retzer (Illinois Natural History Survey), and Roy Smoger (Illinois EPA).

REGIONAL DESCRIPTIONS

Illinois has been divided into six level III ecoregions and 25 level IV ecoregions. Many of the boundaries of these ecoregions are transitional, and the ecoregion map (Figure 1) should be interpreted with that in mind. Ecoregion descriptions follow, and include differentiating criteria; their detail varies and depends on available information. Figure 1 is the map of level III and IV ecoregions in Illinois. Table 2 contains ecoregion data summaries in tabular format.

52 DRIFTLESS AREA

The partly forested Driftless Area (52) is underlain by carbonate-rich Paleozoic strata, and is covered by loess. Glaciers and glacial deposits have done little to subdue Ecoregion 52's terrain, in stark contrast to the neighboring till plains of Ecoregions 53 and 54; characteristically, glacial till is generally absent from Ecoregion 52. Ecoregion 52 contains deeply dissected hills, rolling uplands, and flat plateau remnants; scattered caves and springs occur. Natural lakes are fewer, stream density is greater, and stream networks are better developed than in the Southeastern Wisconsin Till Plains (53). The Driftless Area (52) includes the highest point in Illinois, Charles Mound (1,257 feet elevation), and the greatest relief in the state, where the Mississippi River has cut through the resistant Silurian dolomite of the Niagara Escarpment. Mean daily low temperatures in winter are colder, and snow cover lasts longer than elsewhere in Illinois (Changnon, 1969; Illinois State Climatologist Office, on-line resource; Nelson, 1978, p. 73).

The potential natural vegetation is maple–basswood forest and bluestem prairie; it is distinct from the mosaic of prairie and oak–hickory forest that is native to the Central Corn Belt Plains (54), and lacks the oak–savanna that is native to parts of the Southeastern Wisconsin Till Plains (53) (Kuchler, 1964). Ecoregion 52 is characterized by distinctive northern plants (Neely and Heister, 1987, p. 28; Schwegman, 1973, p. 10).

Ecoregion 52 is underlain by Ordovician- and Silurian-age dolomite, limestone, and shale (Kolata, 2005). Bedrock outcrops are common in valleys. Lead and zinc have been mined near the city of Galena since the early 19th century; more zinc is now produced than lead, but, between 1820 and 1865, this zone was the main source of lead in the United States (Nelson, 1978, p. 222).

Mollisols and, especially, Alfisols are common in the Driftless Area (52). Soils formed from loess or, on steepest slopes, from residuum and thin loess (Natural Resources Conservation Service, various dates). Loess thins eastward from over 300 inches on bluffs along the Mississippi River to less than 100 inches; it is thinnest on steepest slopes (Fehrenbacher and others, 1968, Figure 2).

Mixed land uses are a characteristic of the Driftless Area (52); cropland in Ecoregion 52 is not as extensive as in Ecoregions 47 and 54 (Chapman and others, 2002), whereas forests are more widespread than in adjacent parts of Ecoregions 47, 53, and 54. Today, land use in Ecoregion 52 largely reflects physiography; typically, agriculture is found on uplands, a mixed assemblage of woodland and agriculture occurs on lowlands, and forests grow on steep slopes, in canyons, and in riparian areas. Pastureland, mixed farms, and dairies occur; principal crops are feed grains and forage for dairy cattle and other livestock.

Upland forests are most extensive on steep slopes; basswood, red oak, and sugar maple dominate mesic slopes, whereas black oak and white oak are common on drier sites. Floodplain forests are dominated by American elm, green ash, and silver maple (Schwegman, 1973, p. 10).

Perennial, spring-fed, cool water streams are common, but intermittent streams are found in ravines. Stream quality ranges from fair to excellent. Upper reaches of the Apple River system have excellent quality, gravel riffles, and clear pools (Smith, 1971, p. 4). Principal water quality issues in Ecoregion 52 as a whole are siltation (particularly in downstream reaches) and pollution from livestock and dairy farms. Reservoirs generally have high trophic states (Omernik and others, 2000).

Amphibian and reptile species richness is much greater than on the forested stream slopes of the Western Dissected Illinoian Till Plain (72i) (Smith, 1961, p. 12).

52a Savanna Section

The partly forested hills of the Savanna Section (52a) contain flat plateau remnants, broad ridge tops, narrow valleys, and buttes capped by resistant dolomite. Ecoregion 52a includes Charles Mound, the highest point in Illinois at 1,257 feet elevation. Valley bottoms are narrower and ridges are less pronounced than in Ecoregion 52b. Natural lakes are fewer, stream density is greater, and stream networks are better developed in Ecoregion 52a than in the Southeastern Wisconsin Till Plains (53).

Alfisols are common, but Mollisols also occur. Upland soils are mostly well-drained. They developed from loess or, on steepest slopes, from the residuum of underlying dolomite, limestone, and shale (Kolata, 2005); glacial till-derived soils are generally absent in contrast to the neighboring Rock River Drift Plain (53a) where they are extensive (Natural Resources Conservation Service, various dates).

In the early 19th century, dry to mesic prairies (often dominated by little bluestem and side-oats grama) and oak savanna were widespread on rolling uplands and flat plateau remnants. Steeper slopes were covered by upland hardwood forests (Schwegman, 1973, p. 10).

Today, land use in Ecoregion 52a reflects physiography; agriculture is found on the uplands, a mix of woodland and agriculture occurs in lowland areas, and forests grow in canyons and on steep slopes. Pastureland is common, and farms and dairies occur (Natural Resources Conservation Service, various dates). Overall, agriculture is more common, and forest cover is less extensive, than in the more rugged Paleozoic Plateau/Coulees Section (52b).

52b Paleozoic Plateau/Coulees Section

Ecoregion 52b is a rugged, deeply dissected, loess-covered plateau that is mostly forested; typically, relief is greater, ridges are sharper, and hill slopes are steeper and more densely forested than in the Savanna Section (52a) or in neighboring parts of Ecoregions 53 and 54. The greatest relief in Illinois occurs in Ecoregion 52b, where the Mississippi River cuts through the resistant Silurian carbonates of the Niagara Escarpment (Nelson, 1978, p. 53). This ragged escarpment is not always prominent; nevertheless, it separates the cropland-dominated Western Corn Belt Plains (47) from the mixed land use of the Driftless Area (52).

Alfisols are common, but Mollisols also occur (Natural Resources Conservation Service, various dates). Upland soils are mostly well-drained. They developed from loess or, on steep slopes, from the residuum of underlying dolomite, limestone, and shale (Kolata, 2005); soils derived from glacial till are generally absent.

In the early 19th century, Ecoregion 52b was mostly covered by upland hardwood forest dominated by sugar maple, basswood, and red oak, but loess hill prairies were found on steep, southwesterly facing river bluffs (Schwegman, 1973, p. 10); overall, potential natural vegetation was distinct from the Savanna Section (52a) or the Central Corn Belt Plains (54), where bluestem prairie was much more common (Kuchler, 1964).

Today, a mix of forest and agriculture occurs, with agriculture mostly confined to lowlands and flatter hilltops. The decommissioned Savanna Army Depot covers about 13,000 acres, and supports over thirty endangered or threatened plants and animals (Suloway and others, 1996).

53 SOUTHEASTERN WISCONSIN TILL PLAINS

Ecoregion 53 in Illinois is composed of nearly level to hilly till plains, nearly level outwash plains, and hummocky to hilly morainal areas. Lakes and marshes are much more common than in the Central Corn Belt Plains (54) or the Driftless Area (52), and the terrain is usually flatter than in Ecoregion 52. Drainage conditions vary with soil texture, terrain, and stream network development. Dark-colored Mollisols and, especially, light-colored Alfisols are common, and were derived from eastwardly thinning loess, westwardly thinning glacial drift, glacial outwash, residuum, or alluvium. Histosols occur in depressional morainal areas, and developed from herbaceous organic deposits.

Ecoregion 53 naturally supports a mosaic of vegetation types, and acts as a vegetal transition between the hardwood forests and oak savannas of ecoregions to the west, and the tall-grass prairies that originally dominated Ecoregion 54 to the south (Omernik and others, 2000, p. 91). The potential natural vegetation is a mix of oak savanna, bluestem prairie, maple–basswood forest, and oak–hickory forest (Kuchler, 1964). At the time of settlement, forests were common on moraines, along water courses, and on dissected uplands, whereas prairie occurred on level to rolling uplands (Schwegman, 1973, p. 11-12).

Today, more than half of Ecoregion 53 is used for agriculture; forests, wetlands, and home sites make up the remaining area. Pastureland is found throughout the ecoregion. Cropland, on the other hand, occurs in the Rock River Drift Plain (53a), but is uncommon in eastern morainal areas. Main crops are forage and feed grains supporting local dairy and livestock farms, but cash-grain farming is also important.

Aquatic habitats include clear, well vegetated natural lakes, clear gravel-bottomed creeks, and wetlands, including bogs, fens, and marshes. Such habitat diversity helps to explain why aquatic species diversity in Ecoregion 53 is naturally higher than in many other nearby ecoregions.

53a Rock River Drift Plain

The Rock River Drift Plain (53a) is principally composed of till and outwash plains. It is nearly level to hilly, and is physiographically distinct from the hummocky, lake- and marsh-studded Kettle Moraines (53b). Stream networks are better developed and more integrated in Ecoregion 53a than in the younger Kettle Moraines (53b). The soils of the Rock River Drift Plain (53a) typically developed from glacial till, outwash deposits, loess, or alluvium; in contrast, glacial deposits are generally absent from the neighboring Driftless Area (52).

In the early 19th century, oak savanna, prairie, and, on fire-protected dissected uplands and along water courses, forest occurred (Kuchler, 1964; Neely and Heister, 1987, p. 28; Schwegman, 1973, p. 10-11).

Today, more than half of Ecoregion 53a is cropland; main crops are forage and feed grains supporting dairy operations and livestock, but cash-grain farming is also important. Overall, cropland is much more common than in Ecoregion 53b, but is less common than in the Rock River Hills (54g) or the Illinois/Indiana Prairies (54a).

53b Kettle Moraines

Ecoregion 53b is a poorly drained, hilly to hummocky morainal area that is characterized by many lakes, conspicuous glacial landforms, and wetlands including bogs, fens, and marshes. Drainage networks are less integrated and more poorly developed than on the older till and outwash plains of Ecoregion 53a. Lakes in Ecoregion 53b are typically larger and more concentrated than to the south in the Valparaiso Morainal Complex (54f), and much more common than in neighboring Ecoregions 53a, 54e, and 54a. Characteristically, soils are largely derived from thick late-Wisconsinan glacial drift; loess deposits, if they occur, are thin. Alfisols are common, but Mollisols and Histosols also occur (Natural Resources Conservation Service, various dates). Overall, organic soils are more extensive than elsewhere in Illinois, and Mollisols are less common than in Ecoregions 53a and 54a.

In the early 19th century, moraines were covered by savanna, prairie, and especially, forest, whereas depressions commonly contained wetlands (Vestal, 1931, p. 209; Schwegman, 1973, p. 12). Overall prairie was much rarer than in neighboring Ecoregions 54a, 54e, and 54f.

Today, tracts of timber and nonforested wetlands remain, but there are many summer resorts and permanent homes near lakes. Bogs in Illinois are limited to poorly drained depressions of the northeastern Valparaiso morainal system, and include northern and eastern floristic elements (Schwegman, 1973, p. 11-13).

Ecoregion 53b tends to have a higher concentration of lakes with lower trophic states than in the rest of the Ecoregion 53 (Omernik and others, 2000, p. 92). Some lakes, including Cedar, Channel, Grass, and Loon lakes, contain a rich variety of native fish species. However, many other lakes contain introduced sport fishes (Smith, 1971, p. 5). The blue-spotted salamander is restricted to the morainic systems of northeastern Illinois (i.e., Ecoregions 53b and 54f) (Neely and Heister, 1987, p. 28). The banded killifish, blackchin shiner, and pugnose shiner are now found exclusively in Ecoregion 53b (Illinois Natural History Survey, on-line resource); the former two species are presently listed as threatened in the state, whereas the latter is endangered in Illinois (Illinois Department of Natural Resources, on-line resource “b”).

54 CENTRAL CORN BELT PLAINS

Ecoregion 54 in Illinois is composed of vast glaciated plains that were once largely covered by prairies, but that are now dominated by agriculture. Wisconsinan-age till is extensive; older, Illinoian-age, glacial deposits are found in the west. Extensive, nearly level till, lake, and outwash plains with scattered sand sheets and dunes occur. Dissection is greatest in the west on the Illinoian till plain portion of Ecoregion 54, where enough time has elapsed since the Illinoian Glacial Stage to develop an integrated drainage network; overall, however, the Central Corn Belt Plains (54) is less dissected than the Interior River Valleys and Hills (72). Concentric morainal ridges occur, and become especially conspicuous in areas glaciated by Wisconsinan ice sheets.

In the early 19th century, level uplands were dominated by tall-grass prairie; no other level III ecoregion in Illinois had as much prairie as Ecoregion 54 at the time of settlement (Neely and Heister, 1987, p. 28 and 30; Schwegman, 1973, p. 14-15). Scattered groves of trees and marshes also occurred on level uplands, and river valleys and moraines were mostly forested.

Dark, fertile soils are characteristic of the Central Corn Belt Plains (54) (Woods and others, 1998). Mollisols are common, and contrast with the Alfisols that are common in neighboring ecoregions where forest was naturally more extensive including the Driftless Area (52), Western Dissected Illinoian Till Plain (72i), Southern Illinoian Till Plain (72j), and Kettle Moraines (53b) (Fehrenbacher and others, 1967, fig. 14; Horsley, 1986, fig. 5.6). Soils derived from loess are found in the west over Illinoian till deposits; loess is thickest downwind of the major floodplains. Soils derived primarily from drift are found in central and eastern areas on Wisconsinan till plains. Soils derived from relatively recent deposits of till, loess, or alluvium are not strongly developed, lack claypans, and are richer in minerals than older soils (Schwegman, 1973, p. 6).

In the early 19th century, poorly drained land, ponds, and swamps were common where morainal barriers, low-lying or flat land, or poorly developed drainage networks occurred (Nelson, 1978, p. 51). Subsequently, to make the land more suitable for cropland and settlement, extensive parts of the Illinoian and Wisconsinan till plains in Ecoregion 54 have been tiled, ditched, and tied into existing drainage systems. In so doing, once abundant aquatic habitats have been modified, reduced in size, or eliminated, and nearly all of the original prairies have been replaced by agriculture.

Today, cropland is extensive, and livestock farming is important. Main crops are corn and soybeans; cattle, sheep, poultry, and, especially, hogs are raised, but are not as dominant as farther west in the drier Western Corn Belt Plains (47) (Woods and others, 1998).

Agriculture has affected stream chemistry, turbidity, and habitat. Streams in the loess-mantled western part of Ecoregion 54 are more turbid, and have less fish species diversity, than eastern areas (personal communication with Mike Retzer, 2005).

54a Illinois/Indiana Prairies

The vast, glaciated, flat to rolling plains of Ecoregion 54a are characterized by dark, very fertile soils that developed under tall-grass prairie; in addition, marshes and wet prairies naturally occurred in poorly drained areas, and forests grew on concentric moraines and floodplains. Overall, at the time of settlement, trees were less common than in the Southeastern Wisconsin Till Plains (53) and Interior River Valleys and Hills (72), and native vegetation was distinct from the hardwood forests that covered the drift plains of Ecoregions 55 and 56 in Indiana

The soils of the Illinois/Indiana Prairies (54a) are typically rich in organic material, and developed from loess, glacial drift, or lacustrine sediments. Soils derived from loess occur primarily in the west over Illinoian till deposits; loess is thickest downwind of the major floodplains, and generally thins eastward (Fehrenbacher and others, 1967, fig. 9). Younger soils derived primarily from Wisconsinan drift are found in central and eastern areas on the Wisconsinan till plain; they lack the claypans that characterize many soils in the Southern Illinoian Till Plain (72j) (Schwegman, 1973, p. 6). Mollisols are common and characteristic; they are distinct from the Alfisols that dominate the Driftless Area (52), Western Dissected Illinoian Till Plain (72i), Southern Illinoian Till Plain (72j), and Kettle Moraines (53b), where more extensive forests naturally occurred (Fehrenbacher and others, 1967, fig. 14; Horsley, 1986, fig. 5.6).

At the time of settlement, poorly drained land, ponds, and swamps were common. Poor drainage was especially pronounced in the youngest, most recently glaciated parts of the Wisconsinan till plain. However, even on much older, more dissected till plains in the west where drainage systems are comparatively well integrated, many lowlands between moraines were naturally wet or seasonally covered by standing water (Nelson, 1978, p. 42). Subsequently, extensive parts of the Illinoian and Wisconsinan till plains have been tiled, ditched, and tied into the

existing drainage system to make the land more suitable for cropland and settlement. In the process, marshes and pothole lakes were drained, and once abundant waterfowl were displaced (Schwegman, 1973, p. 14).

Nearly all of the original prairies have now been replaced by agriculture. Corn and soybeans are the main crops; cattle, sheep, poultry, and, especially, hogs are also raised, but they are not as dominant as farther west in the drier Western Corn Belt Plains (47) (Woods and others, 1998). Agriculture has affected stream chemistry, turbidity, and habitat.

Western streams on the Illinoian till plain have fewer species, tend to dry up sooner during drought periods, and have lower gradients, more clayey beds, and fewer gravel riffles than eastern streams on the Wisconsinan till plain (personal communication with Roy Smoger, 2005). Similar macroinvertebrate assemblages occur in western and eastern parts of Ecoregion 54a (personal communication with Mark Joseph, 2005).

54b Chicago Lake Plain

The Chicago Lake Plain (54b) lies between Lake Michigan and the Valparaiso Morainal Complex (54f), and characteristically has a lake-modified climate. Ecoregion 54b is now dominated by the Chicago urban area, but, originally, it was the bed of glacial Lake Chicago. Flat or nearly flat land is extensive, but paleo-beach ridges, sand dunes, paleo-sand bars, paleo-spits, bluffs, and both morainal and bedrock ridges occur. Stream dissection and relief are minimal, and natural drainage is typically poor. Soils are young, and were primarily derived from lacustrine sediments, beach deposits, outwash material, and glacial till (Natural Resources Conservation Service, various dates). Prairies, fens, and marshes were common at the time of settlement, and scrub-oak forests grew on sandy ridges (Schwegman, 1973, p. 13-14). Today, nearly all of the natural vegetation has been replaced by urban development.

The Chicago Lake Plain (54b) can be differentiated from neighboring inland areas by its lake-moderated climate, unique terrain, physiographic history, present land use, and native beach-dune plant communities. The Michigan Lake Plain (56d) has higher dunes, more woodlands, and less urban-industrial activity than Ecoregion 54b.

54c Kankakee Marsh

Prior to the 19th century, the nearly level plains and bottomlands of Ecoregion 54c were subject to intermittent or permanent flooding, and were dominated by unique northern swamp forests containing pin oak, wet prairies, and bulrush–cattail marshes (Fryxell, 1932, p. 26; Vestal, 1931; Woods and others, 1998). Natural drainage is very poor. Since settlement, nearly all of Ecoregion 54c has been artificially drained and converted to agriculture; one of the only remnants of natural vegetation that still remains is a narrow corridor of forested wetlands along the Kankakee River (Woods and others, 1998). Much of the Kankakee River system has been straightened and deepened to increase channel gradient and capacity (Fryxell, 1932, p. 26-27). Ditches are common. Corn, soybeans, and hay are grown on artificially drained, sandy soils. Livestock farming also occurs.

54d Sand Area

Ecoregion 54d consists of disjunct, sandy outwash plains, and is distinguished from adjacent ecoregions by its extensive sand plains, relict dunes, mix of natural vegetation, natural soil drainage properties, irrigation needs, and stream characteristics. The Sand Area (54d) received vast amounts of medium textured glaciofluvial material from melting glaciers. Before vegetation could establish itself, strong westerly winds formed discontinuous sand dunes (Nelson, 1978, p. 45). Mixed oak savanna, scrub oak forests, and dry sand prairie then stabilized low dunes. Dry sand prairie is native on sand sheets. Moister areas had mesic or wet prairies, whereas lowest, wettest sites were covered by marshes (Schwegman, 1973, p. 13-16). Today, scrub forest remains on nutrient-poor, sandy, excessively drained dune soils. Elsewhere, cropland and pastureland occur. Crops on sandy outwash plains require irrigation, whereas drainage ditches are common in poorly drained areas.

The outwash deposits serve as aquifers. Plentiful, easily accessible ground water occurs in Ecoregion 54d, and is an important local source for irrigation and for stream flow. As a result, streams in the Sand Area (54d) generally have cooler summer stream temperatures and greater summer flow than in the Illinois/Indiana Prairies (54a). Undisturbed streams are typically clear and well-vegetated, and have sand-bottomed pools, gravel riffles, and a sand loving fish community; fishes like the least darter, ironcolor shiner, and weed shiner occur (personal communication with Mike Retzer, 2005; Illinois Natural History Survey, on-line resource; Schwegman, 1973, p. 16; Smith, 1971, p. 5); the ironcolor shiner is listed as threatened in Illinois, whereas the weed shiner is endangered in the state (Illinois Department of Natural Resources, on-line resource “b”). Other streams and rivers, including the Green River, have been highly modified, thereby degrading natural habitat (Nelson, 1978, p. 66; personal communication with Mike Retzer, 2005).

54e Chiwaukee Prairie Region

The lake and till plains of Ecoregion 54e are found near the Lake Michigan shore, and contain beaches, sand dunes, swales, low sandy beach ridges, and bluffs; physiography is distinct from the neighboring Valparaiso Morainal Complex (54f) and Kettle Moraines (53b). Ecoregion 54e was once covered by distinctive tall-grass prairies, scrub oak forests, fens, marshes, sand prairies, and sand savannas that supported a diverse fauna. Today, cropland and residential, commercial, and industrial development dominate Ecoregion 54e; most of the natural prairies are gone. Nonetheless, important recreation and conservation areas occur, including Illinois Beach State Park, Illinois Beach Natural Area, and Illinois Dunes Natural Area. Ecoregion 54e is part of an important migratory route for birds. Remaining marshes contain several species that are threatened or endangered in Illinois, such as the marsh speedwell and the eastern prairie-fringed orchid; the latter is also listed as federally threatened species (Illinois Department of Natural Resources, on-line resource "b"; Illinois Natural History Survey, on-line resource; U.S. Fish and Wildlife Service, on-line resource). In Illinois, the common tern breeds in only a few places near Lake Michigan, including Ecoregion 54e, and is listed as endangered in Illinois (Illinois Department of Natural Resources, on-line resource "b"; Schwegman, 1973, p. 13).

54f Valparaiso-Wheaton Morainal Complex

Ecoregion 54f is a hilly, hummocky to rolling area containing moraines, kames, eskers, and outwash plains. Characteristically, the Valparaiso Morainal Complex (54f) is studded with small lakes and marshes, and lacks a well integrated drainage system. Lake size and density are less than in the physiographically similar Kettle Moraines (53b), but are much greater than in the physiographically distinct Illinois/Indiana Prairies (54a) and Chicago Lake Plain (54b). Soils are largely derived from thick, late-Wisconsinan glacial drift; loess deposits, if they occur at all, are only thin. Alfisols are common; Mollisols also occur, but are less common than in Ecoregions 53a, 54a, 54b, and 54c.

In the early 19th century, prairie and forest dominated the moraines, and swamp white oak forests and marshes occurred in poorly drained areas. Overall, prairie once covered slightly more than half of Ecoregion 54f. Subsequent fire suppression has reduced the number of prairie openings, thereby increasing forest density (Schwegman, 1973, p. 12).

Today, pastureland is common and, particularly in the east near Chicago, urban and suburban development is accelerating. However, wooded areas, lakes, and wetlands are still common. The spotted turtle in Illinois is restricted to the Valparaiso Morainal Complex (54f), and is listed as endangered in the state (Illinois Department of Natural Resources, on-line resource "b"; Illinois Natural History Survey, on-line resource).

54g Rock River Hills

Ecoregion 54g is mostly composed of agriculturally dominated, rolling hills and undulating plains; however, more rugged, partly forested ridges, ravines, and bluffs occur in the southeast and northwest. Physiography is strongly influenced by the underlying limestone, dolomite, and sandstone; it is not significantly masked by the region's thin mantle of glacial till. Caves occur in limestone and dolomite. Most soils were derived from loess, but other soils in major valleys typically developed from glacial outwash or alluvium, and still others were derived from till or residuum (Natural Resources Conservation Service, various dates).

In the early 19th century, dry, shortgrass prairies characteristic of Ecoregion 52 were found on undulating to rolling uplands, and transitioned into mesic prairies dominated by big bluestem and Indian grass. Dry or mesic upland forests grew on ridge slopes and on fire-protected uplands, Canada yew–yellow birch forests grew on cool bluffs and in ravines, and floodplain forests occurred on bottomlands (Schwegman, 1973, p. 14). Native flora is influenced by bedrock, with several species confined to areas underlain by sandstone (Schwegman, 1973, p. 14).

Today, more than half of Ecoregion 54g is used as cropland; livestock farming is also important, and forest remnants are largely confined to steep slopes and riparian areas. Main crops include corn, soybeans, and wheat. Field tiles are normally used for drainage. Cropland is more common than in Ecoregions 52 and 53, but is much less extensive than in the Illinois/Indiana Prairies (54a).

71 INTERIOR PLATEAU

In Illinois, Ecoregion 71 is composed of mostly forested, rugged hills that contain bluffs, ravines, and, in the south, karst features. Crestal elevations, local relief, and forest density are greater, and land use is much different, than in the broad, agriculturally-dominated plains of Ecoregion 72j to the north. Physiography, natural drainage conditions, and native vegetation are all distinct from the Wabash–Ohio Bottomlands (72a). Soils are primarily derived from loess and residuum of underlying sandstone, siltstone, shale, and limestone; on valley floors, alluvial soils occur. Soils derived from glacial till are not typical or common in Ecoregion 71, in strong contrast to the Central Corn Belt Plains (54) and Southern Illinoian Till Plain (72j) (Natural Resources Conservation Service, various dates). However, thin, discontinuous till, deposited by Illinoian-age ice at its maximum extent, occurs in some northernmost areas (Lineback, 1967). The potential natural vegetation of Ecoregion 71 in Illinois is oak–hickory forest (Kuchler, 1964). Today, the Interior Plateau (71) in Illinois remains mostly forested, and National Forest land is extensive. In addition, pastureland, hayland, limestone glades, and some cropland occurs.

71m Northern Shawnee Hills

The rugged, forested Northern Shawnee Hills (71m) ecoregion is composed of a high, south-facing sandstone escarpment, as well as cliffs, bluffs, ravines, and canyons. It is underlain by massive Pennsylvanian sandstone, siltstone, and shale, and is largely unglaciated. Ecoregion 71m is physiographically and lithologically distinct from the lower, less rugged, carbonate-rich, Karstic Southern Shawnee Hills (71n).

Soils in Ecoregion 71m were largely derived from loess or residuum (Natural Resources Conservation Service, various dates); they are not very productive because they have been leached of nutrients through time, lack organic material, typically are steeply sloping, and often contain fragipans that impede internal drainage and discourage root penetration (Nelson, 1978, p. 105; Schwegman, 1973, p. 27).

At the time of settlement, the Northern Shawnee Hills (71m) ecoregion was entirely forested; few if any prairies occurred (McManis, 1964, p. 6).

Today, considerable forest remains, mostly within the Shawnee National Forest; pastureland, hayland, and some cropland also occurs. Upland forests are typically dominated by white oak, black oak, and shagbark hickory. Cool, shaded ravines support mesic forests composed of trees including red oak, beech and sugar maple, and contain relict plant species with northern affinities (Neely and Heister, 1987, p. 31; Schwegman, 1973, p. 28). Floodplain forests of bottomlands are dominated by sycamore, black walnut, Kentucky coffeetree, sugarberry, and honey locust.

High gradient, clear streams occur; pools typically have rock bottoms, and riffles have gravel bottoms. Streams support several distinctive fishes including rock bass, black redhorse, banded sculpin, blackspotted topminnow, spottail darter, and stripetail darter (Smith, 1971, p. 7; Schwegman, 1973, p. 28); in Illinois, the latter three species are restricted to the southern part of the state (Illinois Natural History Survey, on-line resource). Ecoregion 71m shares a number of fish species (mostly darters) with the Crawford–Mammoth Cave Uplands (71a) in Kentucky (personal communication, 2005, Mike Retzer).

71n Southern Shawnee Hills

Ecoregion 71n is composed of hills that are mostly underlain by limestone and sandstone, and that are characterized by karst. Caves, sinkhole plains, sinkhole ponds, and springs occur, and are especially common in areas underlain by Mississippian Salem, St. Louis, and Ste. Genevieve limestones (Weibel and Panno, 1997). Ecoregion 71n is both physiographically and lithologically distinct from the neighboring, higher, more rugged Northern Shawnee Hills (71m).

At the time of settlement, the Southern Shawnee Hills (71n) ecoregion was mostly forested, but, unlike Ecoregion 71m, limestone glades with dry prairies probably occurred (Schwegman, 1973, p. 27-28). The Southern Shawnee Hills (71n) ecoregion contains flora from the Appalachian Mountains, Great Plains, Mississippi Alluvial Plain, and Ozark Mountains (personal communication, 2005, Mike Retzer).

Today, many limestone glades and extensive forest remain, mostly within the Shawnee National Forest. Pastureland, hayland, and some cropland also found in Ecoregion 71n, and are more common than in Ecoregion 71m. Dry upland forests contain blackjack oak, post oak, scarlet oak, pignut hickory, and white oak. Cool, shaded ravines are covered in mesic forests containing red oak, beech, and sugar maple (Schwegman, 1973, p. 27-28). Floodplain forests are found in bottomlands. Limestone glades are dominated by little bluestem and side-oats grama, and contain southern flora (Schwegman, 1973, p. 28).

Streams are typically clear, and are often fed by cold springs; pools have rock bottoms, and riffles have gravelly bottoms (Smith, 1971, p. 7; Schwegman, 1973, p. 28). However, small intermittent streams that are not spring-fed also occur (Smith, 1971, p. 7).

72 INTERIOR RIVER VALLEYS AND HILLS

Ecoregion 72 in Illinois is comprised of old till plains, hills, forested river bluffs, major rivers, and valleys containing levees, oxbow lakes, islands, and scattered sand sheets and dunes. Ecoregion 72 is veneered by eastwardly thinning loess (Fehrenbacher and others, 1967, fig. 9). Its wide, flat-bottomed valleys are filled with alluvium, outwash, aeolian, or lacustrine deposits. Illinoian-age glacial deposits and land forms are extensive, but Wisconsinan-age glacial deposits are absent in contrast to Ecoregion 54 (Lineback, 1979). Over half of the once flat till plain has been strongly dissected since the retreat of ice; enough time has elapsed since the end of the Illinoian Glacial Stage to form hills and integrate drainage systems in Ecoregion 72 (Fenneman, 1938, p. 510; McManis, 1964, p. 10; Nelson, 1978, p. 41-42).

The Interior River Valleys and Hills (72) ecoregion is a transitional area between the more forested Ozark Highlands (39), and the flatter, less dissected, more extensively cropped, and much less forested Central Corn Belt Plains (54). Within and between the major river systems of Ecoregion 72, considerable variability in water quality, stream conditions, and aquatic biota occur, and fish species can be limited to certain river systems (Smith, 1971).

The potential natural vegetation of well-drained upland areas is a mosaic of oak–hickory forests and bluestem prairies (Kuchler, 1964). At the time of settlement, forest was much more common in Ecoregion 72 than in Ecoregion 54a. Prairies were discontinuous, but were usually found in undulating to rolling parts of Ecoregion 72 (McManis, 1964, p. 8-9); however, they were not nearly as extensive as in Ecoregion 54. Groves containing pin oak, post oak, swamp white oak, and blackjack oak grew on flat to nearly level, poorly drained uplands with clay-rich soils (Vestal, 1931, p. 214; Schwegman, 1973, p. 21). Beech–maple forests naturally occurred in mesic ravines along the Vermilion River (Schwegman, 1973, p. 24). Bottomland hardwood forests and swamps are native on poorly drained, nearly level sites along the major rivers.

Soils are mostly Alfisols that typically developed from several feet of loess; they contrast with the Mollisols that dominate the Central Corn Belt Plains (54) (Fehrenbacher and others, 1967, fig. 9; Horsley, 1986, fig. 5.6). Claypans, which restrict root penetration and the movement of groundwater, occur in strongly developed soils, and are associated with post oak flatwoods in south central Illinois (Schwegman, 1973, p. 5); they are not common to the north in Ecoregion 54.

Today, less than half of Ecoregion 72 is in cropland, whereas about 30 percent is in pastureland, and the remainder is in forest. Forests are now most commonly found on steeper slopes. Patterns of land use are more varied in Ecoregion 72 than in adjacent ecoregions to the north, east, and west, where corn and soybean farming is extensive (Chapman and others, 2002; Woods and others, 1998). Nearly all of the flat, cultivated uplands in Ecoregion 72 have been tiled and tied into the stream system to improve drainage (Nelson, 1978, p. 51-52). Stream water quality and aquatic habitat have been degraded or disturbed by ditching and draining, crop and livestock production, sheet erosion from cultivated slopes, and strip mining.

In the Mississippi River system, turbidity, current, and volume all increase significantly downstream of its junction with the Missouri River; resultant changes in the aquatic biota also occur, helping to differentiate the Upper Mississippi Alluvial Plain (72d) from the Middle Mississippi Alluvial Plain (72e) (Chapman and others, 2002). Fish communities also vary by stream system, helping to differentiate the Wabash–Ohio Bottomlands (72a) and Wabash Lowlands (72b) from the Upper Mississippi Alluvial Plain (72d) and Middle Mississippi Alluvial Plain (72e) (Smith, 1971); the bluebreast darter is found only in Ecoregion 72b and is endangered in Illinois, whereas the dusky darter, greenside darter, mountain madtom, and river chub (endangered in Illinois) are limited to the Wabash-Ohio river systems (Illinois Natural History Survey (on-line resource); Illinois Department of Natural Resources (on-line resource “b”); Schwegman, 1973).

Ecoregions 72g and 72l act as the transition between the Interior River Valleys and Hills (72) and the Ozark Highlands (39); they contain many Ozarkian and southern plants and animals that are rare or absent elsewhere in Illinois (Neely and Heister, 1987, p. 30).

72a Wabash–Ohio Bottomlands

Ecoregion 72a is composed of poorly drained floodplains, low terraces, oxbow lakes, meander scars, sloughs, and scattered low dunes, and was once covered by bottomland forests, wet and mesic prairies, marshes, and swamps (Schwegman, 1973, p. 24; Vestal, 1931, p. 215). Bottomland forests contain pin oak, bur oak, Shumard oak, swamp white oak, and other species with affinities to more southerly ecoregions (see Table 2). Wet and mesic prairies were dominated by tall grasses, while marshes supported cord grass and river bulrush. Swamps dominated by bald cypress and water tupelo were most common in the Cache River Basin. Physiography, natural drainage conditions, and native vegetation are all distinct from nearby Ecoregions 71m, 71n, 72j, 72k, and 72m. Low gradient streams with silt or sand bottoms occur, and are inhabited by Ohio River-type fish fauna (Woods and others, 2002).

Valley train deposits, alluvium, slackwater deposits, lacustrine deposits, and loess cover the area (Nelson, 1978, p. 59-60; Lineback, 1979). Outcrops of bedrock are rare, and never form cliffs like those that flank the Upper Mississippi Alluvial Plain (72d) and the Middle Mississippi Alluvial Plain (72e) (Schwegman, 1973, p. 23).

Today, some woodlands, marshes, and swamps remain, but most have been cleared and drained for agriculture. Land use is affected by seasonally high water tables and localized flooding. Soybeans, corn, and wheat are the main crops, and livestock farming occurs. There are numerous oil and gas wells.

72b Glaciated Wabash Lowlands

Ecoregion 72b in Illinois is a till plain that is dissected by rugged, forested ravines. Alfisols and Mollisols occur and were derived from loess, glacial till, or alluvium. In the early 19th century, prairie and dry upland forest occurred on undulating to rolling till plains, floodplain forests grew on bottomlands, and beech–maple forests were found in ravines flanking the Vermilion River and its tributaries (Schwegman, 1973, p. 24). Native beech–maple forests are a characteristic of the Glaciated Wabash Lowlands (72b) in Illinois; at the time of settlement, beech–maple forests were extensive in Indiana and Ohio, but they protruded only slightly into Illinois along the Vermilion River (Woods and others, 1998; Schwegman, 1973, p. 24). Today, nearly all of the level upland areas have been cleared for cropland and pastureland, but forests remain in steep ravines (Illinois Department of Natural Resources, on-line resource “a”). Main crops are corn, soybeans, wheat, and hay (National Agricultural Statistics Service, 1997). Surface mining of coal has been extensive.

72d Upper Mississippi Alluvial Plain

Ecoregion 72d encompasses the broad floodplains and low river terraces of the Mississippi River and its major tributaries above the Mississippi’s confluence with the Missouri River, including much of the Illinois River. Levees, oxbow lakes, islands, and scattered sand sheets and dunes occur. Soils were mostly derived from thick, silty and clayey alluvium, and are usually poorly drained. Others soils developed from sandy outwash. Both the alluvial plain and the river channel have been heavily modified in the last 100 years.

Prior to the 19th century, bottomland forests, prairies, and marshes were common. Bottomland forests were adapted to prolonged flooding, and dominated by silver maple, American elm, and green ash (Schwegman, 1973, p. 17); fewer tree species occurred than in the bottomlands of the Upper Mississippi Alluvial Plain (72d) than in the Middle Mississippi Alluvial Plain (72e) (Schwegman, 1973, p. 26). Mesic and wet prairies occurred on wide bottomlands, and dry prairie grew on the sand sheets (Schwegman, 1973, p. 17-18).

Today, the natural vegetation has largely been replaced by agriculture. Corn and soybeans are the major crops. Long reaches of the Mississippi River have been channelized, and many low dams with locks have been constructed upstream of St. Louis. Turbidity, current, and volume in the Mississippi River increase abruptly at its confluence with the Missouri River (Chapman and others, 2002). Resultant changes in the aquatic biota occur, and help to differentiate the Upper Mississippi Alluvial Plain (72d) from the Middle Mississippi Alluvial Plain (72e). The Mississippi River in Ecoregion 72d lacks distinctive, silt-tolerant, fish species that characteristically occur downstream in the more turbid waters of Ecoregion 72e (Schwegman, 1973, p. 26).

72e Middle Mississippi Alluvial Plain

Ecoregion 72e encompasses the floodplains and low river terraces of the Mississippi River from its confluence with the Missouri River to Thebes Gorge, just north of the Ohio River. Bottomlands are broad, and were formed by glacial flood waters (Schwegman, 1973, p. 26). Levees, meander scars, oxbow lakes, islands, spring-fed swamps, and sloughs occur. Both the alluvial plain and the river channel have been significantly modified in the last century by human activities.

Prior to settlement, bottomland forests, prairies, marshes, and, in the south, bottomland swamps were common in the Middle Mississippi Alluvial Plain (72e). Its bottomland forests were adapted to prolonged flooding, and contained a few southern lowland species; more tree species naturally occurred in Ecoregion 72e than in the Upper Mississippi Alluvial Plain (72d) (Schwegman, 1973, p. 26-27).

Today, nearly all of the original prairies, marshes, swamps, and forests have been drained and converted to cropland or pastureland. Soybeans, corn, and wheat are the main crops.

Turbidity, current, and volume in the Mississippi River increase abruptly at its confluence with the Missouri River (Chapman and others, 2002). Resultant changes in the aquatic biota occur, and help to differentiate the Middle Mississippi Alluvial Plain (72e) from the Upper Mississippi Alluvial Plain (72d). Ecoregion 72e contains a distinctive fish assemblage of silt-tolerant plains species that are not found upstream in Ecoregion 72d (Schwegman, 1973, p. 26). Several species of fish have not been found elsewhere in Illinois, including the flathead chub, sicklefin chub, sturgeon chub, plains minnow, and the Alabama shad; the bantam sunfish, listed as threatened in Illinois, is restricted to spring-fed swamps such as those that occur in Ecoregion 72e (Illinois Natural History Survey, on-line resource; Schwegman, 1973, p. 26).

72f River Hills

The dissected and forested hills, bluffs, cliffs, and ravines of Ecoregion 72f flank the floodplains of the Mississippi, Illinois, and lower Sangamon rivers in west central Illinois. Ecoregion 72f is characteristically underlain by limestone and sandstone, and is deeply covered by loess (Fehrenbacher and others, 1967, fig. 9, Schwegman, 1973, p. 24). Most of Ecoregion 72f was glaciated by pre-Wisconsinan ice (Lineback, 1979). Areas of karst occur, and are most abundant in unglaciated areas of Ecoregion 72f in Calhoun County (Weibel and Panno, 1997).

Sugar maple, basswood, and red oak are common on mesic sites, whereas black and white oaks occur on drier sites, and post oak is found near ridge tops. Floodplain forests grow on bottomlands, and are dominated by silver maple, cottonwood, hickories, and sycamore. Ecoregion 72f is part of an extensively forested habitat corridor along the Mississippi River. Wooded valleys in Ecoregion 72f are important nighttime roosting areas for wintering bald eagles (Neely and Heister, 1987, p. 30).

72g Southern Ozarkian River Bluffs

Ecoregion 72g is composed of rugged, loess-capped bluffs and ravines that flank the Mississippi River in southwestern Illinois. It is part of a nearly continuous, forested river corridor that promotes the northward dispersal of southern fauna.

Today, considerable forest remains in Ecoregion 72g, mostly within the Shawnee National Forest; prevailing land use and associated environmental issues are distinct from those in nearby, agriculturally-dominated regions such as the Middle Mississippi Alluvial Plain (72e). Scattered loess hill prairie occurs on bluff tops and some slopes, but is much less common than in Ecoregion 72l (Schwegman, 1973, p. 25). The upland forests of Ecoregion 72g are species-rich, and contain oaks, sugar maple, bitternut hickory, and basswood. Floodplain forests contain American elm, cottonwood, white oak, red oak, sycamore, and river birch. Plants adapted to acidic soil, including shortleaf pine and azalea, are found on steep, cherty slopes; they are absent from Ecoregion 72l, where acidic soils are generally lacking (Schwegman, 1973, p. 6).

The Southern Ozarkian River Bluffs (72g) is underlain by Paleozoic cherty limestone that is more resistant to erosion and groundwater solution than the limestone of the Karstic Northern Ozarkian River Bluffs (72l); as a result, Ecoregion 72g is more rugged, has more surface drainage, and has much less karst than Ecoregion 72l (Schwegman, 1973, p. 24). Soils in Ecoregion 72g are usually Alfisols. they developed from thick loess on bluff tops, and thin loess, acidic residuum, or colluvium on steep slopes (Natural Resources Conservation Service, various dates). Ecoregion 72g is driftless unlike Ecoregion 72l which is partly mantled by Illinoian till (Lineback, 1979).

Distinctive amphibian and reptile species occur, and are characterized by Ozarkian and southern flora that are absent from the River Hills (72f) (Schwegman, 1973, p. 24; Smith, 1961, p. 12-13). In Illinois, the scarlet snake is known to occur only in Ecoregion 72g, and the spring cavefish is limited to a few areas in southern Illinois including Ecoregion 72g. The flat-headed snake is listed as threatened in Illinois, and occurs in both Ecoregions 72 and 72g; it is found nowhere else in the state (Schwegman, 1973, p. 25; Illinois Natural History Survey, on-line resource).

72i Western Dissected Illinoian Till Plain

Ecoregion 72i is a well dissected, pre-Wisconsinan till plain with broad, nearly level interfluves, and many forested slopes, ravines, and floodplains. It is generally more dissected and forested than the Illinois/Indiana Prairies (54a), and is physiographically distinct from the broad flats and hills of the Southern Illinoian Till Plain (72j). The Western Dissected Illinoian Till Plain (72i) is capped with loess and till, and is underlain by Pennsylvanian and Mississippian limestone, sandstone, shale, and coal; outcrops are common in valleys and ravines (Schwegman, 1973, p. 19). Alfisols are common, and are low in organic matter, acidic, and well-drained. Mollisols also occur, but are less extensive than in Ecoregion 54a; they developed in thick loess (Natural Resources Conservation Service, various dates).

In the early 19th century, oak–hickory forests covered well-drained slopes, whereas more mesic sites supported white oak, red oak, and basswood (Schwegman, 1973, p. 19). Prairies were found on nearly level interfluves (Nelson, 1978, p. 104). Marshes and wet prairie also occurred, but were less common than in the Central Corn Belt Plains (54).

Today, cropland and pastureland have almost entirely replaced the native prairies; corn and soybeans are the main crops. Steep slopes and ravines remain largely wooded, but forested acreage is less than it was at the time of settlement. Artificial drainage is less extensive than in neighboring Ecoregions 54a; partially as a result, nitrate concentrations in the surface waters of Ecoregion 72i tend to be lower than in Ecoregion 54a (personal communication, 2005, Charles Pederson). Sheet erosion can be severe on cultivated slopes.

72j Southern Illinoian Till Plain

Ecoregion 72j is a partly dissected till plain that was once covered by forests and prairies. Broad flats, rolling hills, and subdued moraines are common. Towards the south, the terrain becomes more hilly as glacial till thins and bedrock approaches the surface (Nelson, 1978, p. 42; Schwegman, 1973, p. 21). Overall, dissection is greater, moraines are less prominent, and forests are naturally more extensive than in the Illinois/Indiana Prairies (54a). Ecoregion 72j is physiographically different from the Western Dissected Illinoian Till Plain (72i). The underlying Paleozoic sandstone, limestone, coal, and shale is mantled by loess and Illinoian-age glacial till; younger Wisconsinan-age till is absent, in contrast to Ecoregion (54) where it is extensive (Lineback, 1979; Kolata, 2005). Upland soils in the Southern Illinoian Till Plain (72j) are clayey or silty, derived from loess and till, and have poor internal drainage. Impervious fragipans or claypans are common and characteristic. Soils are droughty during dry periods, excessively wet during the spring, and acidic (Natural Resources Conservation Service, various dates; Nelson, 1978, p. 105; Schwegman, 1973, p. 21). Claypans are much more common, and natural drainage is poorer, than in the Western Dissected Illinoian Till Plain (72i). Overall soil quality and productivity are lower than in the Central Corn Belt Plains (54) (Mausel, 1970, p. 135).

In the early 19th century, about 40% of the well-drained uplands in Ecoregion 72j were covered by prairies. The remaining uplands were covered by scattered trees, groves, and forests (Schwegman, 1973, p. 22). Groves containing pin oak, post oak, swamp white oak, and blackjack oak are native to nearly level, poorly drained uplands with clay-rich soils. Oak–hickory forests occurred on relatively dry valley slopes. Mesic forests containing red oak, elm, basswood, and walnut dominated low morainal ridges (Vestal, 1931, p. 214-215).

Today, nearly all of the original prairies in Ecoregion 72j, and most of its original forests (especially in the south) have been converted to agriculture. Soybeans, corn, and wheat are the primary crops, and livestock farming is important. Forests are now largely confined to side slopes and river bottoms that are unsuitable for farming. Natural soil wetness conditions in Ecoregion 72j are generally unfavorable for crops, and, therefore, nearly all of the ecoregion's flat and nearly level uplands have been tiled to improve drainage. Soybeans are better adapted to drought than corn, and can mature even when spring planting is delayed by field wetness; as a result, soybean acreage exceeds that of corn in the Southern Illinoian Till Plain (72j) (Nelson, 1978, p. 105; National Agricultural Statistics Service, 1997). Sheet erosion can be severe on cultivated slopes.

The northern crayfish frog, eastern fence lizard, ground skink, and broadheaded skink are common in the Southern Illinoian Till Plain (72j), but are rare in the Illinois/Indiana Prairies (54a) (Illinois Natural History Survey, on-line resource). Sanctuaries providing nesting habitat for the greater prairie chicken, listed as endangered in Illinois, have been established in Ecoregion 72j (Illinois Department of Natural Resources, on-line resource "b"; Schwegman, 1973, p. 22).

72k Cretaceous Hills

Ecoregion 72k is composed of unglaciated, steep to rolling hills that are characteristically underlain by unconsolidated sands, gravels, and clays of Cretaceous- and Tertiary-age. The Cretaceous Hills (72k) is lithologically distinct from other ecoregions in Illinois. Upland soils are derived from loess and, locally, from unconsolidated sediments (Schwegman, 1973, p. 28-29).

In the early 19th century, forests containing upland oaks, black gum, hickories, and tuliptree, were common. Mesic prairies occurred locally on wide stream bottoms, and dry prairies were found on eastern uplands (Schwegman, 1973, p. 29).

Today, steeper slopes remain mostly wooded. Elsewhere, the land has been converted to livestock farms, general farms, and cropland growing corn, wheat, hay, and soybeans.

The range of the spotted dusky salamander in Illinois, listed as endangered in the state, is largely restricted to Ecoregion 72k (Illinois Department of Natural Resources, on-line resource "b"; Illinois Natural History Survey, on-line resource).

72l Karstic Northern Ozarkian River Bluffs

Ecoregion 72l includes loess-mantled Mississippi River bluffs, ravines, and karst features that developed on underlying limestone; nowhere else in Illinois are there as many sinkholes, sinkhole ponds, and caves (Weibel and Panno, 1997). Ozarkian limestone glade flora, well developed karst, and distinctive amphibian and reptile assemblages characterize the ecoregion.

The Karstic Northern Ozarkian River Bluffs (72l) is underlain by Mississippian limestone that is less resistant to erosion and groundwater solution than the cherty limestone of the neighboring Southern Ozarkian River Bluffs (72g); as a result, Ecoregion 72l has less rugged topography, better developed karst, and less surface drainage than Ecoregion 72g (Schwegman, 1973, p. 24).

Soils are typically Alfisols. They developed from thick loess on bluff tops, and from thin loess, colluvium, or residuum on steep slopes (Natural Resources Conservation Service, various dates).

Potential natural vegetation is mostly oak–hickory forest (Kuchler, 1964); in addition, loess hill prairies were once common on loess-covered bluff tops and steep slopes in Ecoregion 72l, but were rare in neighboring Ecoregion 72g. The native flora includes a distinctive assemblage of Ozarkian limestone glade species; Ozarkian flora is absent from the River Hills (72f) to the north (Schwegman, 1973, p. 25).

Today, steeper slopes remain mostly wooded. Elsewhere, the land has been converted to pastureland and cropland; corn, wheat, soybeans, and hay are the main crops. Apple and peach orchards occur.

Ecoregion 72l is a part of an important, forested habitat corridor along the Mississippi River. The coachwhip, a snake listed as endangered in Illinois, is restricted to Ecoregion 72l (Illinois Department of Natural Resources, on-line resource "b"; Illinois Natural History Survey, on-line resource). The flat-headed snake is listed as threatened in Illinois, and occurs in both the Karstic Northern Ozarkian River Bluffs (72l) and the Southern Ozarkian River Bluffs (72g); it is found nowhere else in the state (Schwegman, 1973, p. 25; Illinois Natural History Survey, on-line resource).

72m Wabash River Bluffs and Low Hills

Ecoregion 72m is composed of partly forested, low bluffs along the Wabash River. Alfisols are common, and are characteristically derived from thick loess (Natural Resources Conservation Service, various dates). Ecoregion 72m is lower, less rugged, and less wooded than the hills and bluffs along the Mississippi River in Ecoregions 72f, 72l, and 72g, but more wooded, rugged, and deeply loess-covered than Ecoregions 72a and 72j.

In the early 19th century, dry upland forests (dominated by black oak and hickories), mesic upland forests (dominated by white oak, red oak, and sugar maple), floodplain forests, and mesic prairies occurred in Ecoregion 72m (Schwegman, 1973, p. 23).

Today, forests are still common in Ecoregion 72m on steeper slopes and in ravines; flatter areas are cultivated. Main crops are corn, wheat, soybeans, and hay.

73 MISSISSIPPI ALLUVIAL PLAIN

Ecoregion 73 is a nearly flat, alluvial plain that extends along the Mississippi River from southern Illinois to the Gulf of Mexico. Temperature and precipitation increase from north to south. Bottomland deciduous forests and bottomland swamps largely covered Ecoregion 73 in Illinois before they were cleared for cultivation (Schwegman, 1973, p. 29). Cropland is now widespread, and livestock farming occurs; soybeans, corn, and wheat are the main crops.

73a Northern Holocene Meander Belts

Ecoregion 73a encompasses the broad, flat to nearly flat floodplains, low terraces, islands, and meander belts of the Mississippi River that occur downstream of Thebes Gorge, near the confluence of the Mississippi and Ohio rivers. Swales, abandoned channels, oxbow lakes, sloughs, natural levees, and point bars occur. Ecoregion 73a was never glaciated, but, instead, was heavily influenced by flood waters from melting glaciers to the north. Soils are derived from Recent alluvium, and are naturally fertile; they are generally clay-rich except along the rivers. Potential natural vegetation is southern floodplain forest; it is distinct from the oak–hickory forest of nearby upland Ecoregions 71n, 72k, and 72q (Kuchler, 1964). At the time of settlement, Ecoregion 73a was mostly covered by bottomland deciduous forests and, on frequently flooded sites, by bottomland swamps (Schwegman, 1973, p. 29). Natural vegetation includes southern species that are at or near their northern distributional limit, including bald cypress and tupelo gum (Woods and others, 2002).

Today, most of the forests and swamps in Ecoregion 73a in Illinois have been cleared and drained for agriculture (Illinois Department of Natural Resources, on-line resource “a”). Cropland is now widespread, and livestock farming occurs; soybeans, corn, and wheat are the main crops (National Agricultural Statistics Service, 1997). Only scattered remnants of bottomland forests and bottomland swamps still occur, and they are largely confined to islands, oxbows, the insides of levees, and, especially, conservation areas. Undrained areas are typically subject to seasonal flooding.

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PEER REVIEWERS

Chris Lant, Professor (Executive Director of Universities Council on Water Resources, Co-director of the Environmental Resources and Policy Program), Department of Geography, Southern Illinois University; Andy Rorick, Geologist, U.S. Forest Service; Michael Sublett, Professor, Department of Geography-Geology, Illinois State University

TABLE 1: COMMON AND SCIENTIFIC NAMES CITED IN TEXT

AMPHIBIANS AND REPTILES	
Blue-spotted salamander	*Ambystoma laterale*
Broadheaded skink	*Eumeces laticep*
Coachwhip	*Masticophis flagellum*
Spotted dusky salamander	*Desmognathus conanti*
Eastern fence lizard	*Sceloporus undulatus*
Ground skink	*Scincella laterali*
Northern crayfish frog	*Rana areolata*
Flat-headed snake	*Tantilla gracilis*
Scarlet snake	*Cemophora coccinea*
Spotted turtle	*Clemmys guttata*
BIRDS	
Common tern	*Sterna hirundo*
Greater prairie chicken	*Tympanuchus cupido*
FISH	
Alabama shad	*Alosa alabamae*
Banded killifish	*Fundulus diaphanus*
Banded sculpin	*Cottus carolinae*
Bantam sunfish	*Lepomis symmetricus*
Blackchin shiner	*Notropis heterodon*
Black redhorse	*Moxostoma duquesnei*
Bluebreast darter	*Etheostoma camuru*
Blackspotted topminnow	*Fundulus olivaceus*
Cypress darter	*Etheostoma proeliare*
Flathead chub	*Platygobio gracilis*
Greenside darter	*Etheostoma blennioides*
Harlequin darter	*Etheostoma histrio*
Ironcolor shiner	*Notropis chalybaeus*
Least darter	*Etheostoma microperca*
Mountain madtom	*Noturus eleutherus*
Plains minnow	*Hybognathus placitus*
Pugnose shiner	*Notropis anogenus*
River chub	*Nocomis micropogon*
River redhorse	*Moxostoma carinatum*
Rock bass	*Ambloplites rupestris*
Sicklefin chub	*Macrhybopsis meeki*
Small mouth bass	*Micropterus dolomieu*
Spottail darter	*Etheostoma squamiceps*
Spring cavefish	*Forbesichthys agassizi*
Stripetail darter	*Etheostoma kennicotti*
Sturgeon chub	*Macrhybopsis gelida*
Weed shiner	*Notropis texanus*

VEGETATION

American elm	*Ulmus americana*
American lotus	*Nelumbo lutea*
Bald cypress	*Taxodium distichum*
Basswood	*Tilia americana*
Beech	*Fagus grandifolia*
Big bluestem	*Andropogon gerardii*
Bitternut hickory	*Carya cordiformis*
Black cherry	*Prunus serotina*
Black gum	*Nyssa sylvatica*
Blackjack oak	*Quercus marilandica*
Black oak	*Quercus velutina*
Black walnut	*Juglans nigra*
Black willow	*Salix nigra*
Blueberry	*Vaccinium* spp.
Bluejoint grass	*Calamagrostis canadensis*
Box elder	*Acer negundo*
Bulrush	*Scirpus* spp.
Bur oak	*Quercus macrocarpa*
Canada yew	*Taxus canadensis*
Catalpa	*Catalpa speciosa*
Cattail	*Typha latifolia*
Cherrybark oak	*Quercus pagoda*
Cinnamon fern	*Osmunda cinnamomea*
Common reed	*Phragmites communis*
Cottonwood	*Populus deltoides*
Cranberry	*Oxycoccus macrocarpus*
Cucumber tree	*Magnolia acuminata*
Drummond's red maple	*Acer rubrum* var. *drummondii*
Dwarf birch	*Betula pumila*
Eastern prairie-fringed orchid	*Platanthera leucophaea*
Fall witch grass	*Leptoloma cognatum*
Gama grass	*Tripsacum dactyloides*
Green ash	*Fraxinus pennsylvanica*
Hackberry	*Celtis occidentalis*
Heart-leaved tragia	*Tragia cordata*
Honey locust	*Gleditsia triacanthos*
Indian grass	*Sorghastrum nutans*
June grass	*Koeleria cristata*
Kentucky coffeetree	*Gymnocladus dioica*
Kingnut hickory	*Carya laciniosa*
Lady fern	*Athyrium filix-femina*
Leatherleaf	*Chamaedaphne calyculata*
Little bluestem	*Schizachyrium scoparium*
Marsh speedwell	*Veronica scutellata*
Mockernut hickory	*Carya tomentosa*
Ohio buckeye	*Aesculus glabra*
Overcup oak	*Quercus lyrata*
Pecan	*Carya illinoensis*
Pignut hickory	*Carya glabra*
Pickerelweed	*Pontederia cordata*
Pin oak	*Quercus palustris*
Pitcher plant	*Sarracenia purpurea*
Post oak	*Quercus stellata*
Plains buttercup	*Ranunculus rhomboideus*
Porcupine grass	*Stipa spartea*

VEGETATION (continued)

Prairie cord grass	*Spartina pectinata*
Prairie dropseed	*Sporobolus heterolepis*
Pumpkin ash	*Fraxinus profunda*
Red buckeye	*Aesculus pavia*
Red oak	*Quercus rubra*
River bulrush	*Scirpus fluviatilis*
Royal fern	*Osmunda regalis*
Sand dropseed	*Sporobolus cryptandrus*
Scarlet oak	*Quercus coccinea*
Sedge	*Cyperaceae (various species)*
Shagbark hickory	*Carya ovata*
Shingle oak	*Quercus imbricaria*
Shortleaf pine	*Pinus echinata*
Shumard oak	*Quercus shumardii*
Side-oats grama	*Bouteloua curtipendula*
Silver maple	*Acer saccharinum*
Slippery elm	*Ulmus rubra*
Sphagnum moss	*Sphagnum* spp.
Sugarberry	*Celtis laevigata*
Sugar maple	*Acer saccharum*
Sundew	*Drosera* spp.
Swamp chestnut oak	*Quercus michauxii*
Swamp cottonwood	*Populus heterophylla*
Swamp white oak	*Quercus bicolor*
Sweet gum	*Liquidambar styraciflua*
Switch grass	*Panicum virgatum*
Sycamore	*Platanus occidentalis*
Tamarack	*Latrix laricina*
Tuliptree	*Liriodendron tulipifera*
Tupelo gum	*Nyssa aquatica*
Water locust	*Gleditsia aquatica*
White ash	*Fraxinus americana*
White birch	*Betula papyrifera*
Wild blue sage	*Salvia azurea*
White oak	*Quercus alba*
White pine	*Pinus strobus*
Winterberry	*Ilex verticillata*
Yellow birch	*Betula alleghaniensis*

TABLE 2: SUMMARY TABLE – CHARACTERISTICS OF THE ECOREGIONS OF ILLINOIS

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
52a. Savanna Section	283	Hills dominated by broad ridge tops; flat plateau remnants and high, mound-like erosional remnants occur. Valley bottoms are narrow. Cool, clear, perennial, spring-fed streams and a few caves occur.	800-1257/ 100-250	Thin to thick Quaternary loess, dolomitic limestone residuum, and calcareous shale residuum. Loess depth is commonly 100 to 200 inches. Ordovician and Silurian limestone, dolomite, and shale. Mounds are capped with resistant dolomite.	Uplands: Mostly Alfisols (Hapludalfs); also Mollisols (Hapludolls). Floodplains and low terraces: Entisols (Fluvaquents, Udifluvents).	On uplands: Fayette, Palsgrove, Dubuque, Lacrescent, Rozetta, Eleroy, Newglarus, Lamoille. Upland soils are derived from loess or residuum, not from glacial till, and are well-drained. On floodplains and low terraces: Wakeland, Dorchester.
52b. Paleozoic Plateau/ Coulees Section	363	Rugged, deeply dissected plateau. Hills, loess-capped river bluffs, canyons, ravines, and valleys occur, along with a few caves and springs. Includes the Niagaran Escarpment; north-facing slopes of the escarpment are steeper than south-facing slopes which are cut by narrow valleys that deepen with increasing distance from the crest of the escarpment. Cool, clear, perennial, spring-fed streams occur.	600-1100/ 200-475	Thin to thick Quaternary loess and dolomitic limestone residuum. Commonly, loess is 200 to 300 inches thick on hills and bluffs along the Mississippi River. Silurian and Ordovician limestone, dolomite, and shale. Bedrock outcrops are common along the major water courses.	Uplands: Mostly Alfisols (Hapludalfs); also, Mollisols (Hapludolls). Floodplains and low terraces: Entisols (Fluvaquents, Udifluvents) and Alfisols (Albaqualfs).	On uplands: Fayette, Dubuque, Lamont, Palsgrove, Sparta. Upland soils are derived from loess or residuum, not from glacial till, and are well-drained. On floodplains and low terraces: Wakeland, Dorchester, Zwingle.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
52a. Savanna Section	Mesic/ Udic, Aquic	34-36/ 155-160	5-27/ 56-84	Potential natural vegetation: bluestem prairie and maple–basswood forest. On rolling uplands: in the early 19th century, dry to mesic prairies often dominated by little bluestem and side-oats grama (contained northern Great Plains plant species including plains buttercup, and June grass) and oak savanna. On mesic hill slopes: upland hardwood forest dominated by sugar maple, basswood, and red oak. On drier sites: white oak on thin, droughty, clayey residual soils, and black oak on ridge tops and rocky cliffs. On cliffs along major streams: white pine, Canada yew, and white (i.e., canoe) birch. On floodplains: forests dominated by silver maple, American elm, and green ash.	Agriculture is found on the uplands, mixed woodland-agriculture occurs in lowland areas, and forests are found on steep slopes and along streams. Pastureland is common, mixed farms and dairies occur, and woodlots are found in steepest areas. Principal crops are feed grains and forage for dairy cattle and other livestock.
52b. Paleozoic Plateau/ Coulees Section	Mesic/ Udic, Aquic	34-36/ 160	4-28/ 60-84	Potential natural vegetation: maple–basswood forest. On mesic upland sites: upland hardwood forest dominated by sugar maple, basswood, and red oak. On drier sites: upland hardwood forest dominated by black oak and white oak. On cliffs and in shaded ravines: white pine, Canada yew, and white (i.e., canoe) birch. On steep, southwesterly facing bluffs above the Mississippi River floodplain: loess hill prairies dominated by little bluestem and side-oats grama. On floodplains: forests dominated by silver maple, American elm, and green ash.	Mostly forest, with agriculture largely confined to level and gently sloping lowlands and hilltops. Canyons and steeper slopes are forested. The decommissioned Savanna Army Depot covers about 13,000 acres, and supports 32 endangered or threatened plants and animals. Approximately 9,400 acres have or will be transferred to the U.S. Fish and Wildlife Service's Upper Mississippi River Wildlife and Fish Refuge.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
53a. Rock River Drift Plain	609	Glaciated, nearly level to hilly till plains and outwash plains. Broad valleys occur.	700-1100/ 50-250	Quaternary glacial till, outwash deposits, thin to thick loess, residuum, and alluvium. Ordovician dolomite, limestone, and shale.	Uplands: Alfisols (Hapludalfs) and Mollisols (Argiudolls). Floodplains and low stream terraces: Mollisols (Endoaquolls, Argiudolls).	On uplands: Flagg, Tama, Pecatonica, Fayette, Ogle, Palsgrove, Ashdale, Edmund, Rockton. On floodplains and low stream terraces: Flagler, Warsaw, Comfrey, Selma.
53b. Kettle Moraines	680	Glaciated, hummocky to hilly area with steeply sloping moraines, outwash plains, closed depressions, mounds, level areas, and many wetlands and natural lakes. The drainage network is not well integrated.	675-1050/ less than 50-150	Wisconsinan-age glacial till, outwash gravels, and thin loess (less than 20 inches). Silurian and Ordovician dolomite, limestone, and shale.	Mostly Alfisols (Hapludalfs, Epiaqualfs); also, Mollisols (Argiudolls, Endoaquolls), Histosols (Haplosaprists).	Morley, Markham, Elliott, Houghton, Nappanee, Ashkum, Marsh, Fox, Beecher, Corwin, Miami, Montmorenci, Boyer, Montgomery, Zurich, Odell, Grays, Littleton, Proctor. Poorly drained, organic soils are common in closed depressions.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
53a. Rock River Drift Plain	Mesic/ Udic, Aquic	35-38/ 156-160	9-27/ 60-83	Potential natural vegetation: bluestem prairie, maple–basswood forest, and oak savanna. On level and rolling uplands: dry prairies (dominants: little bluestem and side-oats grama), mesic prairie (dominants: big bluestem, Indian grass, and prairie dropseed), and wet prairie (dominants: prairie cord grass, bluejoint grass, and big bluestem). In the early 19th century, forest was abundant in more dissected upland areas and along water courses. On fire protected slopes of dissected uplands: dry upland forests (dominants: black oak, white oak, bur oak, and black cherry) and mesic upland forests (dominants: sugar maple, basswood, slippery elm, and red oak). On bottomlands: floodplain forests (dominants: silver maple, black willow, cottonwood, American elm, and green ash).	Cropland, pastureland, and woodlots. More than half is used as cropland. Forage and feed grains for dairy operations and livestock farms are the primary land uses; cash-grain farming is also an important activity. Corn and soybeans are the main crops.
53b. Kettle Moraines	Mesic/ Udic, Aquic	35-38/ 160-170	11-28/ 61-83	Potential natural vegetation: oak–hickory forest, oak savanna, and bluestem prairie. In the early 19th century, savanna, prairie, and, especially, forest occurred on moraines. Wetlands, including bogs, fens, seeps, sedge meadows, and marshes, were and are common. Bogs contain plants adapted to acidic conditions including leatherleaf, blueberry, cranberry, ferns, orchids, pitcher plant, sundew, winterberry, dwarf birch, and tamarack.	Forest, pastureland, and wetland. Homesites are especially common on moraines and near lakes. Ecoregion 53b is an important recreation area, and includes Chain O' Lakes.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
54a. Illinois/ Indiana Prairies	19557	Glaciated, flat to rolling plains with terminal and recessional moraines, prairie potholes, and old lake beds.	450-1000/ 25-275	Thin to thick Quaternary loess (less than 20 to more than 60 inches), Wisconsinan-age till, Illinoian-age glacial till (in the west), outwash deposits, lacustrine sediments, and alluvium. Loess is thickest downwind of major floodplains, and thins eastward. Paleozoic sedimentary rocks. Bedrock is usually deeply buried by glacial drift, but a few outcrops of sandstone occur along the larger rivers such as the Fox and Illinois.	On uplands: Mollisols (Argiudolls, Endoaquolls, Hapludolls). On floodplains and low terraces: Mollisols (Hapludolls, Endoaquolls).	On uplands: Flanagan, Catlin, Drummer, Tama, Joy, Raub, Sable, Muscatine, Ipava, Bryce, Swygert, Elliott, Ashkum, Clarence. Soils typically are high in organic content. Soils derived from loess primarily occur in the west over Illinoian till deposits. Younger soils derived primarily from drift are found in central and eastern areas on the Wisconsinan till plain. On floodplains and low terraces: Lawson, Sawmill, Radford. Natural drainage is poor.
54b. Chicago Lake Plain	439	Nearly level to flat, paleo-lake plain containing beach ridges, swales, sand dunes, paleo-spits, paleo-sand bars, bluffs, and both morainal and bedrock ridges. Stream dissection, relief, and slope angles are all low.	580-650/ 10-90	Quaternary lacustrine sediments, beach deposits, outwash deposits, and glacial till. Silurian sedimentary rock.	Mollisols (Endoaquolls), Entisols (Udipsamments), Alfisols (Hapludalfs).	Milford, Gilford, Oakville, Selma, Coloma, Spinks. Urban land is extensive. Very poorly- and poorly drained soils are common on flat plains.
54c. Kankakee Marsh	11	Nearly level to depressional plain and bottomlands. The bottomlands along the Kankakee River are generally sandy, flat, and until recently, very marshy and flood-prone. Scattered low sand dunes occur.	600-650/ less than 20-50	Quaternary outwash deposits, organic material, sand flats, and alluvium. Silurian dolomite.	Mollisols (Endoaquolls, Hapludolls).	Gilford, Hoopeston. Natural drainage is very poor.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
54a. Illinois/ Indiana Prairies	Mesic/ Udic, Aquic	35-41/ 160-187	9-35/ 62-88	Potential natural vegetation: a mosaic of bluestem prairie and oak–hickory forest. In the early 19th century, mesic prairie (dominants: big bluestem, Indian grass, prairie dropseed, switch grass, and little bluestem), wet prairie (dominants: prairie cord grass, sedges, and bluejoint grass), and, on gravel moraines, kames, and loess-covered river bluffs, dry upland prairie (dominants: little bluestem and side-oats grama) were common; additionally, oak–hickory forest (dominants: black oak, white oak, and shagbark hickory) grew on dry, upper morainal slopes, and maple–oak forest (dominants: red oak, sugar maple, and American elm) were found on more mesic sites. Prairie groves contained bur oak, American elm, and hackberry, and were subjected to recurrent fires. Sycamore, silver maple, and cottonwood are native to floodplains. Bulrushes, sedges, cattails, and common reed dominated prairie potholes and marshes.	Mostly converted to cropland. Corn, soybeans, and wheat are the major crops; livestock farming is also important. Steepest land is used as pastureland or hayland. Extensive parts of the till plain have been tiled, ditched, and tied into the original drainage system to make the land suitable for cropland and settlement; in the process, poorly drained land, ponds, and swamps have been converted to agriculture. Narrow corridors of riparian forest occur. Agriculture has affected stream chemistry, turbidity, and habitat. Coal mining occurs.
54b. Chicago Lake Plain	Mesic/ Aquic, Udic	36-38/ 170-173. Climate is moderated by Lake Michigan.	14-31/ 63-85	Potential natural vegetation: a mosaic of bluestem prairie and oak–hickory forest. Dry prairies, mesic prairies, wet prairies, sand prairies, fens, marshes, floodplain forests, and, on sandy ridges, scrub-oak forests were common prior to settlement.	Mostly urbanized.
54c. Kankakee Marsh	Mesic/ Aquic, Udic	37/ 173	13-31/ 64-85	Potential natural vegetation: a mosaic of bluestem prairie and oak–hickory forest. At the time of settlement, northern swamp forests (dominant: pin oak), wet prairies, bulrush–cattail marshes, and on scattered, low sand dunes, black oak, white oak, and sand prairies occurred.	Mostly cleared and drained for cropland; livestock farming also occurs. Corn, soybeans, and hay are the main crops. A narrow corridor of forested wetlands remains along the Kankakee River. The Kankakee River and many of its tributaries have been straightened and deepened so as to increase both their gradient and capacity. Ditches are common..

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
54d. Sand Area	1978	Discontinuous and low sand dunes, disjunct sandy outwash plains, discontinuous sand sheets, sandy ridges, and swales. Clear, low gradient, sand-bottomed streams occur. Summer stream flow from outwash deposits is cool and plentiful.	450-900/ less than 25-100	Quaternary windblown sand, outwash sand and gravel deposits, silty and clayey quiet water deposits, limestone residuum, and alluvium. Paleozoic shale, limestone, dolomite, and coal. Limestone outcrops are common along the Kankakee River.	Entisols (Udipsamments), Mollisols (Hapludolls, Endoaquolls, Argiudolls), Alfisols (Hapludalfs).	Oakville, Watseka, Kankakee, Plainfield, Selma, Sparta, Maumee, Gilford, Bonfield, Dakota, Onarga, Bloomfield, Hoopeston, Rockton, Plattville, Ade. On sandy ridges, very rapidly permeable, droughty soils are characteristic and are prone to wind erosion. Low-lying, depressional areas are usually poorly drained.
54e. Chiwaukee Prairie Region	52	Lake and till plains with beaches, well developed sand dunes, low beach ridges, swales, and bluffs.	580-800/ less than 10-75	Quaternary nearshore lake deposits, beach deposits, glacial till, thin loess, alluvium, outwash deposits, and colluvium. Silurian limestone, dolomite, and some shale.	Alfisols (Hapludalfs, Endoaqualfs).	Fox, Zurich, Boyer, Grays, Morley, Wauconda, Markham.
54f. Valparaiso Morainal Complex	1755	Glaciated, hilly, hummocky to rolling area containing moraines, kames, eskers, rolling till plains, outwash plains, kettle holes, and ravines. Drainage network is not well integrated. Small lakes and marshes are common.	550-1200/ 50-300	Wisconsinan-age glacial till and Quaternary lake deposits, thin loess (less than 20 inches), and alluvium. Ordovician and Silurian dolomite, limestone, and shale. Bedrock is generally deeply buried by glacial drift, but outcrops occur along some of the streams.	Alfisols (Epiaqualfs, Hapludalfs), Mollisols (Endoaquolls, Argiudolls), Inceptisols (Eutrudepts).	Morley, Markham, Ashkum, Frankfort, Blount, Beecher, Nappanee, Elliott, Bryce, Miami, Hennepin.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
54d. Sand Area	Mesic/ Udic, Aquic	34-38/ 165-182	9-33/ 62-87	Potential natural vegetation: a mosaic of bluestem prairie and oak–hickory forest. At the time of settlement, Ecoregion 54d was largely covered by prairie or mixed oak savanna. On well-drained, upland sandy sites: dry sand prairie dominated by little bluestem, fall witch grass, sand dropseed, June grass, and porcupine grass. On low dunes and sandy ridges: scrub oak forest and mixed oak savanna (dominants: black oak, blackjack oak, and white oak) and dry sand prairie. On moist or wet sites: mesic prairie (dominants: big bluestem, Indian grass, prairie dropseed, switch grass, and little bluestem), wet prairie (dominants: prairie cord grass, sedges, and bluejoint grass), or marshes (dominants: bulrushes, sedges, cattails, and common reed).	Mostly converted to cropland or used as pastureland. On sandy outwash plains, crops require irrigation from ground water-fed central pivot irrigation systems. In poorly drained areas, drainage ditches are common. On excessively drained, low nutrient dune soils: scrub forest or pastureland. Locally, vegetation that once stabilized dunes has been removed, thereby reactivating dunes. Extensive strip mining for Pennsylvanian-age coal occurs.
54e. Chiwaukee Prairie Region	Mesic/ Udic, Aquic	34-36/ 170	12-29/ 61-82	Potential natural vegetation: bluestem prairie and oak savanna. Tall-grass prairies, scrub oak forests, sand prairies, sand savannas, fens, and marshes are native.	Nearly all of the natural prairie vegetation has been replaced by cropland or urban and industrial development. Some woodland remains, and is often associated with dunes. Important conservation and recreation areas occur, including Illinois Beach State Park, Illinois Beach Natural Area, and Illinois Dunes Natural Area. Ecoregion 54e is part of an important bird migration route. Its marshes are habitat for several state threatened and endangered species.
54f. Valparaiso Morainal Complex	Mesic/ Aquic, Udic	34-40/ 160-172	11-31/ 61-85	Potential natural vegetation: a mosaic of oak–hickory forest and bluestem prairie. In the early 19th century, prairie covered slightly more than half of Ecoregion 54f. On well-drained gravel moraines: dry prairies (dominants: little bluestem and side-oats grama) and dry upland forests (dominants: bur oak and white oak). On moister uplands: mesic forests (dominants: sugar maple, basswood, red oak, and white ash). On poorly drained uplands: swamp white oak forests. In marshes: cattails, bulrushes, and common reed are native. On bottomlands: floodplain forests (dominants: silver maple, green ash, and American elm). Subsequent fire suppression has reduced the number of prairie openings, thereby increasing forest density.	Mostly growing urban and suburban developments, but wooded areas, wetlands, and pastureland are common.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
54g. Rock River Hills	1878	Glaciated, mostly rolling hills and undulating plains; more rugged areas occur in the northwest and southeast, and contain ridges, ravines, and bluffs. Tributaries to the Rock River have cut narrow valleys through bedrock. Caves and springs occur.	610-1000/ 50-325	Thick Quaternary loess (more than 60 inches), thin glacial till, glacial outwash, residuum, lacustrine deposits, and alluvium. Ordovician and Silurian dolomite, limestone, and sandstone. Bedrock outcrops are common.	On uplands: Mollisols (Argiudolls, Hapludolls, Endoaquolls), Alfisols (Hapludalfs), Entisols (Quartzipsamments). On floodplains and low terraces: Mollisols (Hapludolls, Endoaquolls, Argiudolls).	On uplands: Tama, Griswold, Muscatine, Joy, Ogle, Sable, Winnebago, Fayette, Rozetta, Downs, Plano, Boone. On floodplains and low terraces: Lawson, Comfrey, Jasper.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
71m. Northern Shawnee Hills	589	Largely unglaciated, rugged hills with cliffs, bluffs, ravines, and canyons. High gradient, clear streams occur, and typically have pools with rock bottoms and riffles with gravel bottoms.	360-830/ 150-450	Thin to thick Quaternary loess, residuum, colluvium, and in northernmost areas, thin and discontinuous Illinoian-age till. Pennsylvanian sandstone, siltstone, and shale. Bedrock outcrops are common.	Alfisols (Fragiudalfs, Hapludalfs), Inceptisols (Dystrudepts).	Grantsburg, Zanesville, Hosmer, Alford, Wellston, Muskingum, Berks. Fragipans occur.
71n. Southern Shawnee Hills	768	Unglaciated hills with bluffs and ravines that are characterized by many caves, sinkhole plains, sinkhole ponds, and springs. There are many clear, cold, spring-fed, perennial creeks. However, small intermittent streams that are not fed by springs also occur. Typically, pools have rock bottoms and riffles have gravel bottoms.	350-670/ 100-200	Thin to thick Quaternary loess, residuum, colluvium, and alluvium. Mississippian limestone, shale, and sandstone. Igneous intrusions and mineralized faults containing fluorspar occur in the east. Bedrock outcrops are common.	Alfisols (Fragiudalfs, Hapludalfs, Paleudalfs). On floodplains: Entisols (Fluvaquents), Inceptisols (Eutrudepts).	Hosmer, Grantsburg, Zanesville, Bedford, Baxter, Wellston. On floodplains: Wakeland, Haymond. Fragipans occur.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
54g. Rock River Hills	Mesic/ Udic, Aquic	34-37/ 159-167	8-29/ 60-85	Potential natural vegetation: mostly a mix of bluestem prairie and oak–hickory forest; in rugged northwest, maple–basswood forest. On level and rolling uplands: dry prairie (dominants: little bluestem and side-oats grama), mesic prairie (dominants: big bluestem, Indian grass and prairie dropseed), and wet prairie (dominants: prairie cord grass, bluejoint grass, and big bluestem). On dissected upland slopes and on fire-protected sites: dry upland forests (dominants: black, white, and bur oaks, and black cherry) and mesic upland forests (dominants: sugar maple, basswood, slippery elm, and red oak). On cool, north-facing bluffs: Canada yew and yellow birch. On bottomlands: floodplain forests (dominants: silver maple, black willow, cottonwood, American elm, and green ash). In marshes: cattails, bulrushes, and sedges.	Mostly cropland, but livestock farming is also an important land use. Forest remnants occur on steep slopes and in riparian areas. Main crops include corn, soybeans, and wheat. Field tiles are normally used for drainage.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
71m. Northern Shawnee Hills	Mesic/ Udic	46/ 185-192	21-41/ 67-89	Potential natural vegetation: oak–hickory forest. Few, if any, prairies occurred prior to settlement. Upland forests are dominated by white oak, black oak, and shagbark hickory. On dry sites: forests contain blackjack, post and scarlet oaks. In sheltered ravines: mesic forests of red oak, beech, sugar maple, tuliptree, bitternut hickory, white ash, black walnut, and basswood. On bottomlands: floodplain forests.	Mostly forest; National Forest land is extensive. Pastureland, hayland, and cropland also occur. Forestry and recreation are important land uses. Stream quality in larger streams is typically good to excellent.
71n. Southern Shawnee Hills	Mesic/ Udic	46/ 185-192	22-42/ 67-89	Potential natural vegetation: oak–hickory forest. Limestone glades with dry prairies (dominant: little bluestem) occurred prior to settlement. Includes flora from the Great Plains, Appalachians, Ozarks, and Mississippi Alluvial Plain. On dry uplands: forests with blackjack, post, scarlet, and white oaks, and pignut hickory. In sheltered ravines: mesic forests of red oak, beech, sugar maple, tuliptree, bitternut hickory, white ash, basswood, and black walnut. On bottomlands: floodplain forests. Limestone glades: little bluestem, side-oats grama, and southern plants (e.g., wild blue sage and heart-leaved tragia). In acidic seep springs: sedges, royal fern, lady fern, and cinnamon fern; also sphagnum moss.	Forest, agriculture, and many limestone glades occur. Livestock grazing, forestry, hay production, cropland agriculture, and recreation are important land uses. Corn and soybeans are the major crops. Quarries and, in the east, mines occur.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
72a. Wabash–Ohio Bottom-lands	1514	Nearly level floodplains and low terraces. Oxbow lakes, meander scars, sloughs, and scattered low dunes occur. Streams have low gradients, and silt or sand bottoms.	310-480/ less than 50	Quaternary alluvium, outwash deposits, slackwater deposits, loess, and lacustrine deposits. Bedrock outcrops are rare.	Mollisols (Hapludolls, Endoaquolls, Argiaquolls), Alfisols (Endoaqualfs, Fragiudalfs, Hapludalfs, Epiaqualfs), Inceptisols (Endoaquepts, Dystrudepts, Eutrudepts), Entisols (Fluvaquents, Udifluvents).	Armiesburg, Ginat, Zipp, Darwin, Petrolia, Wakeland, Emma, Belknap, Carmi, Sciotoville, Bonnie, Cape, Patton, Reesville, Hurst, Nolin, Shoals, Stonelick, Genesee, Disco, Westland, Titus. Poorly drained soils are common. Extensive areas have been tiled to improve drainage.
72b. Glaciated Wabash Lowlands	263	Glaciated, undulating to rolling, dissected till plain with rugged ravines, floodplains, and terraces along the Vermilion River and its tributaries. Many streams have gravel bottoms, and riffles are common.	500-700/ 25-175	Thin to thick Quaternary loess (less than 20 to 60+ inches), glacial till, outwash deposits, and alluvium. Pennsylvanian shale, sandstone, limestone, and coal.	Alfisols (Epiaqualfs, Hapludalfs), Mollisols (Endoaquolls, Argiudolls, Hapludolls).	Fincastle, Sabina, Drummer, Blount, Morley, Sable, Raub, Sawmill, Landes, Shaffton.
72d. Upper Mississippi Alluvial Plain	1886	Broad floodplains and low terraces of the Mississippi River (and its major tributaries) upstream of the confluence with the Missouri River. Levees, oxbow lakes, islands, disjunct sand sheets, and scattered dunes occur. In Ecoregion 72d, the lower Illinois River is more sluggish and has more backwater lakes than the Mississippi River.	420-600/ less than 50	Quaternary alluvium, outwash deposits, and slackwater deposits. Paleozoic sedimentary rock. Bedrock is deeply covered by Quaternary sediments.	Mollisols (Hapludolls, Endoaquolls), Inceptisols (Eutrudepts).	Lawson, Darwin, Beaucoup, Titus, Genesee, Sawmill. Clayey, poorly drained soils are common. but loamy, moderately well-drained or well-drained soils occur.
72e. Middle Mississippi Alluvial Plain	654	Broad floodplains and low terraces of the Mississippi River. Levees, oxbow lakes, islands, spring-fed swamps, disjunct sand sheets, and scattered dunes occur. Bottomlands are broad and were partly formed by glacial flood waters. Typically, this part of the Mississippi River downstream of the Missouri River and upstream of Thebes Gorge is very muddy.	350-420/ less than 50	Quaternary alluvial, outwash, and slackwater deposits. Paleozoic sedimentary rock. Bedrock is deeply covered by Quaternary sediments.	Mollisols (Hapludolls, Endoaquolls), Inceptisols (Endoaquepts).	Lawson, Beaucoup, Darwin, Karnak, Ware, Medway, Cairo. Clayey, poorly drained soils are common. but loamy or sandy, moderately well-drained to well-drained soils occur.

Level IV Ecoregion	Soil Temp./ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
72a. Wabash–Ohio Bottom-lands	Mesic/ Aquic, Udic	42-48/ 187-193	19-43/ 66-89	Potential natural vegetation: mostly southern floodplain forest. On bottomlands: floodplain forests (containing: pin, bur, Shumard, overcup, cherrybark, swamp white, and swamp chestnut oaks, and sweet gum), river edge forests (dominants: black willow, cottonwood, sycamore, and silver maple), wet prairies (dominants: prairie cord grass, sedges, and bluejoint grass), and in the south near the Mississippi River, swamps (with swamp cottonwood, Drummond's red maple, water locust, and, especially in the Cache River Basin, bald cypress and tupelo gum). In sloughs and meander scars: marshes (dominants: prairie cord grass and river bulrush). On better-drained low terraces: shagbark hickory and tuliptree.	Mostly cleared and drained for agriculture, but some woodlands, marshes, and swamps remain. Land use is influenced by seasonally high water tables and localized flooding. Main crops are soybeans, corn, and wheat. Livestock farming occurs. There are numerous oil and gas wells in Ecoregion 72a.
72b. Glaciated Wabash Lowlands	Mesic/ Aquic, Udic	40/ 184-186	17-35/ 63-87	Potential natural vegetation: oak–hickory forest, mosaic of bluestem prairie and oak–hickory forest, and beech–maple forest. In the early 19th century, prairie and dry upland forest (dominants: oaks and hickories) were found on nearly level uplands, and beech forest occurred in the mesic ravines along the Vermilion River.	Nearly level uplands have been cleared for cropland and pastureland, but forests remain in steep ravines. Main crops are corn, soybeans, wheat, and hay. Extensive surface coal mines occur.
72d. Upper Mississippi Alluvial Plain	Mesic/ Aquic, Udic	35-39/ 162-188	7-36/ 60-88	Potential natural vegetation: oak–hickory forest. Native on floodplains: bottomland forests (dominants: silver maple, American elm, and green ash with pin oak, pecan, bur oak, sycamore, honey locust, hickories, and black walnut), mesic prairies (dominants: big bluestem, Indian grass, prairie dropseed, switch grass, and little bluestem), wet prairies (dominants: prairie cord grass, sedges, and bluejoint grass), and marshes (dominants: river bulrush and cattail). Native on sand sheets: dry prairie (dominants: little bluestem, fall witch grass, sand dropseed, June grass, and porcupine grass). Native on low dunes: scrub oak forest.	Mostly cleared and drained for agriculture, but scattered forest remnants occur especially on islands and inside of levees. Main crops are corn and soybeans. The Mississippi River has been extensively channelized, and numerous low dams with locks have been constructed.
72e. Middle Mississippi Alluvial Plain	Mesic/ Aquic, Udic	39-47/ 188-193	19-41/ 67-91	Potential natural vegetation: oak–hickory forest. Prior to settlement, species-rich bottomland forests, wet prairies (dominants: prairie cord grass, sedges, and bluejoint grass), mesic prairies (dominants: big bluestem, Indian grass, prairie dropseed, little bluestem, and switch grass), marshes (dominants: river bulrush, cattail, pickerelweed, and American lotus), and bottomland swamps were common. On clay-rich floodplain soils: bottomland forests (dominants: pin oak, overcup oak, Shumard oak, and cherrybark oak) and, in the south, bottomland swamps (dominants: pumpkin ash, swamp cottonwood, Drummond's red maple, and water locust). On sandy soils of floodplains: bottomland forests (dominants: silver maple, ashes, American elm, honey locust, sugarberry, and pecan). On loamy soils in the south: beech, basswood, and red buckeye.	Nearly all of the original forests, prairies, and marshes have been drained and converted to cropland or pastureland. Main crops are soybeans, corn, and wheat. Both the alluvial plain and the river channel have been significantly modified in the last 100 years.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
72f. River Hills	2815	Hills, bluffs, cliffs, and ravines flanking the Mississippi, lower Illinois and lower Sangamon rivers. Ecoregion 72f is mostly glaciated, rugged, and dissected. Areas of karst occur. Caves and sinkhole ponds are most abundant in the unglaciated areas of Calhoun County.	425-800/ 50-375	Thick Quaternary loess (more than 60 inches) and glacial till (mostly pre-Wisconsinan-age). Paleozoic sedimentary rocks dominated by limestone and sandstone. Bedrock outcrops are common in the bluffs and cliffs.	Alfisols (Hapludalfs, Endoaqualfs).	Seaton, Fayette, Stronghurst, Rozetta, Hickory, Clarksdale.
72g. Southern Ozarkian River Bluffs	212	Mostly unglaciated, rugged bluffs and ravines along the Mississippi River.	320-1000/ 100-680	Thin to thick Quaternary loess, colluvium, residuum, and alluvium. Paleozoic cherty limestone, dolomite, and shale. Bedrock outcrops are common in bluffs and ravines. Ecoregion 72g is driftless and mostly unglaciated; however, the ecoregion's northern tip was covered by Illinoian ice.	Alfisols (Paleudalfs, Hapludalfs).	Goss, Alford, Baxter. On steep bluffs, soils are thin and developed from thin loess or acidic residuum and colluvium. On bluff tops, soils have developed from thick loess.
72i. Western Dissected Illinoian Till Plain	6946	Glaciated, dissected till plain with broad, nearly level interfluves, ravines, and floodplains. Stream gradients are greater in the northern part of Ecoregion 72i than in the southern portion.	490-820/ 50-200. Relief is greater in the north than in the south.	Thick Quaternary loess (more than 60 inches) and pre-Wisconsinan-age glacial till. Pennsylvanian and Mississippian limestone, sandstone, shale, and coal. Bedrock outcrops are common in the valleys and ravines.	On uplands: Mostly Alfisols (Hapludalfs, Endoaqualfs); also Mollisols (Argiudolls, Argiaquolls, Endoaquolls).	Clay, Harrison, Clinton, Rozetta, Hickory, Herrick, Keomah, Ipava, Tama, Virden, Muscatine, Sable. Prairie soils are high in organic matter and developed in several feet of loess. Sheet erosion can be severe on cultivated slopes.

Level IV Ecoregion	Soil Temp./ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
72f. River Hills	Mesic/ Udic, Aquic	36-39/ 169-185	13-37/ 63-87	Potential natural vegetation: mostly oak–hickory forest; also a mosaic of bluestem prairie and oak–hickory forest. On dry sites: forests (dominants: black oak and white oak). On mesic sites: forests (dominants: sugar maple, basswood, red oak, hackberry, slippery elm, and black walnut). On and near ridge tops: post oak. On bottomlands along streams: floodplain forests (dominants: silver maple, hickories, cottonwood, and sycamore). On steep slopes and loess-covered bluff tops: hill prairies (dominants: little bluestem and side-oats grama).	Mostly forest. National Forest land is extensive. Wooded valleys are important roosting area for wintering bald eagles. Ecoregion 72f is part of an important, forested habitat corridor along the Mississippi River.
72g. Southern Ozarkian River Bluffs	Mesic/ Udic	45-47/ 192-193	21-43/ 67-89	Potential natural vegetation: mostly oak–hickory forest. On uplands: extensive, species-rich forests containing red oak, white oak, black oak, sugar maple, bitternut hickory, and basswood. On steep, cherty slopes: flora tolerant of acidic soil conditions, such as shortleaf pine, azalea, and farkleberry. On bottomlands: floodplain forests (containing: white oak, red oak, sycamore, American elm, river birch, and cottonwood). On loess-covered bluff tops and some slopes: scattered loess hill prairies (dominants: little bluestem and side-oats grama).	Mostly forest; also scattered loess hill prairies, and peach and apple orchards. Forestry and recreation are primary land uses. Ecoregion 72g is part of an important, forested habitat corridor along the Mississippi River.
72i. Western Dissected Illinoian Till Plain	Mesic/ Udic, Aquic	36-39/ 170-187	11-36/ 63-88	Potential natural vegetation: mostly oak–hickory forest; also a mosaic of bluestem prairie and oak–hickory forest. On well-drained slopes in dissected areas: forests (dominants: black oak, white oak, and shagbark hickory). On more mesic slopes: forests (dominants: white oak, red oak, and basswood). On broad, near level interfluves such as near Carthage, Bushnell, and Carrollton: extensive prairie (dominants: big bluestem, Indian grass, prairie dropseed, and switch grass). On fine textured soils and on prairie margins: post oak and blackjack oak. On bottomlands of major streams: floodplain forests (dominants: silver maple, American elm, ashes, and box elder). Marshes and wet prairie occurred.	Forest and agriculture. Slopes and ravines remain mostly wooded. Nearly level interfluves, that were once covered by prairie, are now used as cropland or livestock farms. Main crops are corn and soybeans. Strip mining for coal occurs locally.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
72j. Southern Illinoian Till Plain	11577	Glaciated, partly dissected, flat to rolling till plains that become more hilly to the south where bedrock is closer to the surface. Low Illinoian-age moraines occur. Major streams have broad floodplains.	380-800/ 10-100	Thin to thick Quaternary loess (10-60 inches), Illinoian-age glacial till, and alluvium. Paleozoic (mostly Pennsylvanian) sandstone, limestone, coal, and shale. Bedrock is near the surface in the south.	On uplands especially in the north: Alfisols (Hapludalfs, Albaqualfs, Natraqualfs, Natrudalfs, Endoaqualfs). Uplands especially in the south and on side slopes and some flats in the north: Alfisols (Fragiudalfs, Endoaqualfs, Albaqualfs). On floodplains and low terraces: Mollisols (Hapludolls, Endoaquolls), Inceptisols (Eutrudepts, Endoaquepts), Entisols (Fluvaquents).	Uplands especially in the north: Hoyleton, Cisne, Huey, Darmstadt, Oconee, Cowden, Piasa; clayey, slowly- and very slowly-permeable soils are common. Impervious fragipans and claypans occur. Uplands especially in the south and on side slopes and some flats in the north: Ava, Bluford, Wynoose. Impervious fragipans occur. On floodplains and low terraces: Lawson, Beaucoup, Darwin, Haymond, Belknap, Wakeland, Petrolia. Nearly all of the flat uplands are now tiled to improve drainage.
72k. Cretaceous Hills	233	Unglaciated, rolling hills.	310-560/ 50-250	Thin to thick Quaternary loess, residuum, colluvium, and alluvium. Unconsolidated Cretaceous and Tertiary sand, gravel, and silt.	Alfisols (Fragiudalfs, Hapludalfs), Ultisols (Fragiudults).	Hosmer, Lax, Alford, Stoy. Fragipans occur.
72l. Karstic Northern Ozarkian River Bluffs	361	Partly glaciated, bluffs and ravines along the Mississippi River with well developed karst, including numerous caves, sinkholes, sinkhole ponds, and springs.	400-760/ 50-350	Thick Quaternary loess (more than 60 inches) and some Illinoian-age till. Mississippian limestone, sandstone, and siltstone.	Alfisols (Hapludalfs). Most soils developed from thick loess, but on steep river bluffs, thin soils have developed from residuum.	Alford, Menfro, Westmore, Neotoma.
72m. Wabash River Bluffs and Low Hills	749	Low bluffs along the Wabash River.	400-700/ less than 50-100	Thick Quaternary loess (mostly more than 60 inches), outwash material, and Illinoian-age glacial till. Mostly Pennsylvanian limestone; also sandstone, shale, and coal. Bedrock outcrops sometimes occur in the river bluffs and stream cuts.	Alfisols (Fragiudalfs, Hapludalfs, Endoaqualfs).	Hosmer, Stoy, Hickory, Weir. Fragipans occur.

Level IV Ecoregion	Soil Temp./ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
72j. Southern Illinoian Till Plain	Mesic/ Aquic, Udic	39-45/ 187-192	17-40/ 65-88	Potential natural vegetation: mostly oak–hickory forest; also bluestem prairie and oak–hickory forest. Prior to settlement, both forest and prairie were present. On better-drained, nearly level uplands: forests (containing black oak, shingle oak, mockernut hickory, and shagbark hickory) and mesic tall-grass prairie (dominants: big bluestem, Indian grass, prairie dropseed, switch grass, and little bluestem). On nearly level, clay-rich soils of poorly drained uplands: flatwood forests (containing post, swamp white, blackjack, and pin oaks). On relatively dry south- and west-facing valley slopes: forests (dominants: white, shingle, and black oaks). On more mesic valley slopes: forests (containing hickories, white ash, basswood, sugar maple, black cherry, slippery elm, black walnut, and oaks). On morainal ridges: mesic forests (containing red oak, elm, walnut, and basswood). On Kaskaskia River's broad bottomlands: floodplain forests (dominants: silver maple, willows, sycamore, and American elm) and some wet prairie (dominants: prairie cord grass, sedges, and bluejoint grass). On bottomlands of smaller streams: floodplain forests (dominants: pin and shingle oaks with white oak, red oak, hickories, black walnut, river birch, and cottonwood). Marshes were associated with the stream floodplains.	Agriculture and forest. Nearly all of the flat land has been converted to cropland or pastureland. Forests are now concentrated in areas unsuited to farming, such as steep slopes, ravines, and riparian areas. Main crops are soybeans, corn, and wheat. Extensive parts of the till plain have been tiled, ditched, and tied into the original drainage system to make the land suitable for cropland and settlement.
72k. Cretaceous Hills	Mostly Mesic/ Udic	47-48/ 190-192	24-42/ 68-89	Potential natural vegetation: mostly oak–hickory forest. Prior to settlement, forests were extensive, but some mesic prairies occurred on wide stream bottoms and dry prairie were found on eastern uplands. On uplands: forest (black, white, cherrybark, and red oaks, black gum, tuliptree, shagbark hickory, pignut hickory). In the west, beech are common. On broad stream bottoms: mesic prairies (dominants: big bluestem, Indian grass, and gama grass).	Agriculture and forest. Steep slopes remain mostly wooded. Elsewhere, land has been converted to livestock farms, cropland, and general farms. Main crops are corn, wheat, hay and soybeans.
72l. Karstic Northern Ozarkian River Bluffs	Mesic/ Udic	40-45/ 189-192	21-40/ 67-91	Potential natural vegetation: mostly oak–hickory forest; also a mosaic of bluestem prairie and oak–hickory forest. Prior to settlement, forests were extensive, and loess hill prairies were common on loess-covered bluff tops and steep slopes. On ridge tops: forests (dominants: white oak, black oak, and hickories). On more mesic sites: forests (dominants: red oak, sugar maple, basswood, and Ohio buckeye). On bottomlands of streams: floodplain forests (containing white oak, red oak, sycamore, American elm, river birch, and cottonwood). On steep slopes and loess-covered bluff tops: loess hill prairies (dominants: little bluestem and side-oats grama).	Forest and agriculture. Steep slopes remain mostly wooded, but elsewhere pastureland, cropland, and orchards occur. Main crops are corn, wheat, soybeans, hay, apples, and peaches. Ecoregion 72l is part of an important, forested habitat corridor along the Mississippi River.
72m. Wabash River Bluffs and Low Hills	Mesic/ Udic, Aquic	40-46/ 187-190	19-41/ 66-89	Potential natural vegetation: mostly oak–hickory forest; also bluestem prairie and oak–hickory forest. Prior to settlement, dry upland forests (dominants: black oak and hickories), mesic upland forests (dominants: white oak, red oak, and sugar maple), floodplain forests (dominants: silver maple, cottonwood, willows, sycamore, and American elm), and limited amounts of mesic prairie (dominants: big bluestem, Indian grass, prairie dropseed, switch grass, and little bluestem).	Forest and agriculture. Steep slopes and ravines remain mostly wooded. Elsewhere cropland and livestock farming occur. Main crops are corn, wheat, soybeans, and hay.

Level IV Ecoregion	Area (square miles)	Physiography	Elevation/ Local Relief (feet)	Surficial and Bedrock Geology	Soil Order (Great Group)	Common Soil Series
73a. Northern Holocene Meander Belts	109	Unglaciated, broad floodplains, low terraces, islands, and meander belts. Swales, abandoned channels, oxbow lakes, sloughs, natural levees, and point bars occur.	300-340/ 0-25	Quaternary alluvium.	Inceptisols (Endoaquepts), Mollisols (Endoaquolls), Entisols (Fluvaquents).	Karnak, Jacob, Cairo, Belknap, Bonnie. Clayey, poorly- and very poorly drained soils are common and naturally fertile.

Level IV Ecoregion	Soil Temperature/ Moisture Regimes	Precipitation Mean annual (inches)/ Frost Free Mean annual (days)	Mean Temperature January min-max/ July min-max (°F)	Vegetation	Land Cover and Land Use
73a. Northern Holocene Meander Belts	Predominantly Mesic/ Aquic	47/ 193	24-42/ 68-89	Potential natural vegetation: southern floodplain forest. Prior to settlement, bottomland forests and bottomland swamps were extensive. On clay-rich soils of floodplains: species-rich bottomland forests (containing Shumard oak, cherrybark oak, swamp white oak, swamp chestnut oak, pin oak, overcup oak, kingnut hickory, shagbark hickory, bitternut hickory, ashes, sweet gum, black gum, honey locust, sugarberry, pecan, black cherry, and catalpa). On coarser-textured floodplain soils with less impaired drainage: bottomland forests (containing beech, tuliptree, and cucumber tree). In areas subject to frequent or prolonged flooding: bottomland swamps (containing bald cypress and tupelo gum).	Nearly completely cleared and drained for agriculture; only scattered, bottomland forests and swamps remain on islands, oxbows, insides of levees, and, especially, in conservation areas. Cropland is now widespread. Main crops are soybeans, corn, and wheat. Livestock farming also occurs. Land use in undrained areas is influenced by seasonal flooding.

FIGURE 1
ILLINOIS LEVEL III AND LEVEL IV ECOREGIONS

52 Driftless Area
52a Savanna Section
52b Paleozoic Plateau/Coulee Section

53 Southeastern Wisconsin Till Plains
53a Rock River Drift Plain
53b Kettle Moraines

54 Central Corn Belt Plains
54a Illinois/Indiana Prairies
54b Chicago Lake Plain
54c Kankakee Marsh
54d Sand Area
54e Chiwaukee Prairie Region
54f Valparaiso-Wheaton Morainal Complex
54g Rock River Hills

71 Interior Plateau
71m Northern Shawnee Hills
71n Southern Shawnee Hills

72 Interior River Valleys and Hills
72a Wabash-Ohio Bottomlands
72b Glaciated Wabash Lowlands
72d Upper Mississippi Alluvial Plain
72e Middle Mississippi Alluvial Plain
72f River Hills
72g Southern Ozarkian River Bluffs
72i Western Dissected Illinoian Till Plain
72j Southern Illinoian Till Plain
72k Cretaceous Hills
72l Karstic Northern Ozarkian River Bluffs
72m Wabash River Bluffs and Low Hills

73 Mississippi Alluvial Plain
73a Northern Holocene Meander Belts

Level III ecoregion boundary
Level IV ecoregion boundary
State boundary
County boundary

PRINCIPAL AUTHORS: Alan J. Woods (Oregon State University), James M. Omernik (U.S. Geological Survey), Charles L. Pederson (Eastern Illinois University), and Brian C. Moran (Indus Corporation).

COLLABORATORS AND CONTRIBUTORS: Candice Bauer (U.S. Environmental Protection Agency), Bill Ettinger (Illinois Environmental Protection Agency), Gregg Good (Illinois Environmental Protection Agency), Ed Hammer (U.S. Environmental Protection Agency), Mark Joseph (Illinois Environmental Protection Agency), Don Keefer (Illinois State Geological Survey), Laura Keefer (Illinois State Water Survey, Charles Pederson (Department of Biological Sciences, Eastern Illinois University), Andrew Phillips (Illinois State Geological Survey), Don Pitts (U.S. Department of Agriculture–Natural Resources Conservation Service), Mike Retzer (Illinois Natural History Survey), and Roy Smoger (Illinois Environmental Protection Agency.

FIGURE 1
ILLINOIS LEVEL III AND LEVEL IV ECOREGIONS