Residential Development Suitability

of Champaign County, IL



Suitability Analysis:



Soil & Slope



Water



Green Infrastructure

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

October 16th, 2019
UP 503

Daniel Kletzing
MUP

Residential Development Suitability Report Executive Summary

This report is to outline areas of Champaign County which will be suitable for single family, residential development. Areas to consider when siting new neighborhoods include slope, soil, water, and green infrastructure analysis. While slope and soil play an important role in constraining development, it can be hazardous to build in floodplains. Green infrastructure should be conserved due to its value as a provider of ecosystem services.

These 4 areas were analyzed and development suitability maps were created from the U.S. Census Bureau data. Each of the areas, soil, slope, water, and green infrastructure, are discussed separately in this report. The urban form can be thought of as a series of overlapping layers, such as building footprints over streetscapes over subterranean stormwater infrastructure. Each layer gives a unique perspective, according to author Kevin Lynch. "There seems to be a public image of any given city which is the overlap of many individual images" (Lynch 46). To focus on our specific topic, residential suitability, the overlap of these 4 suitability maps, soil, slope, water, and green infrastructure creates a single, composite image which tells the reader the most suitable location in the county for development. Creating a composite map from these overlapping layers has the advantage of being able to analyze all 4 constraints on development in a single map.

It's the responsibility of the developer to get it right when locating new neighborhoods. "Developers are ultimately the responsible party when it comes to managing the creation of our buit environment" (Miles 51). Not only will this report help the residential developer create a greater return on investment in knowing where to site new neighborhoods, it will also tell the developer where *not* to site homes. Preserving natural ecosystems and avoiding hazardous areas to site new homes is the responsibility of the developer. They are the accountable party and need to be aware of the analyses included in this report.

Maps and analyses included in this report:

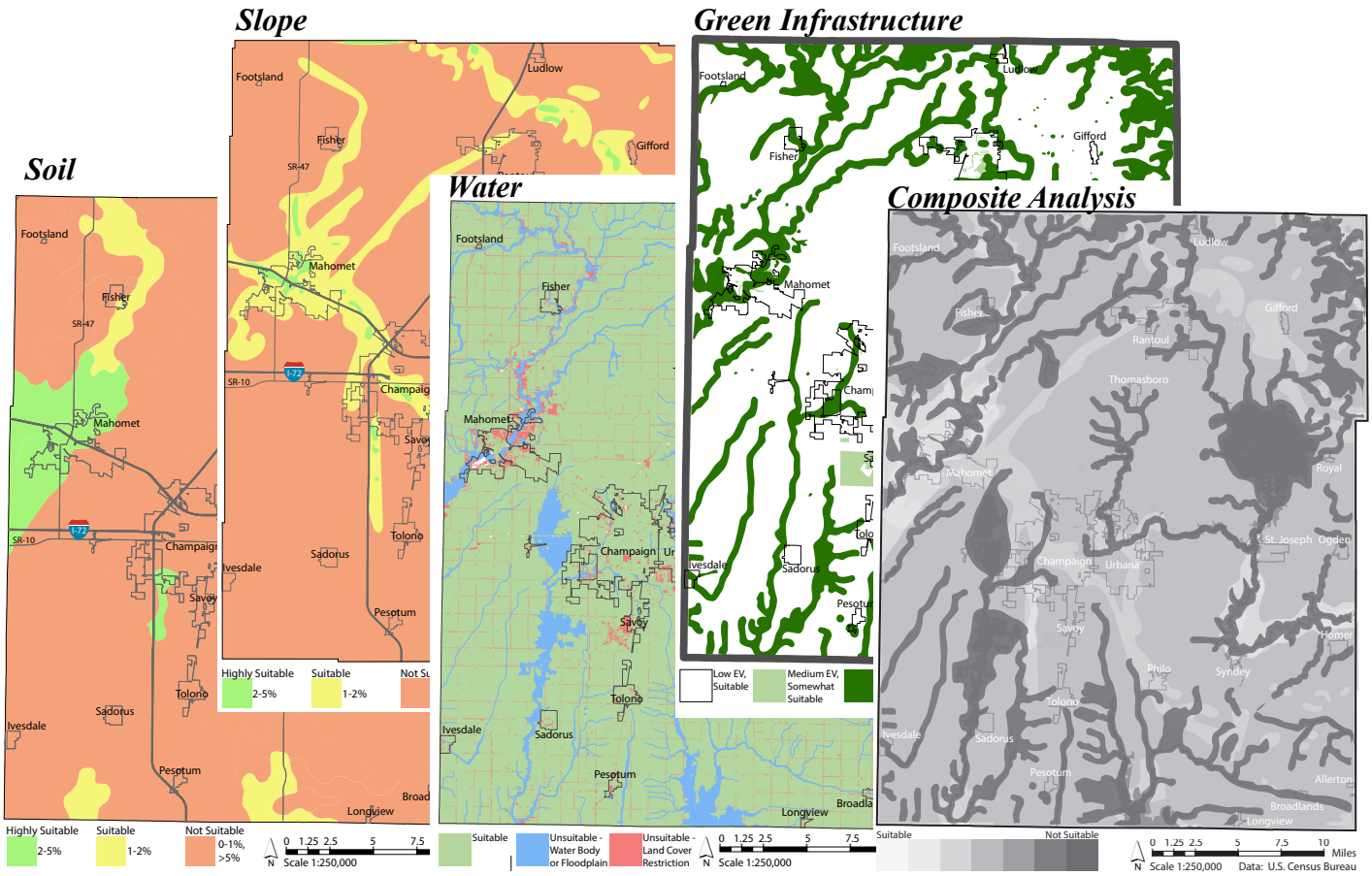


Table of Contents

Section:	Page #:
1. Project Description & County Growth Patterns	1
 2. Slope and Soil Suitability Analysis	2 - 7
 3. Water Suitability Analysis	8 - 11
 4. Green Infrastructure Constraints	12 - 16
5. Composite Suitability Report	17 - 18
6. References	19

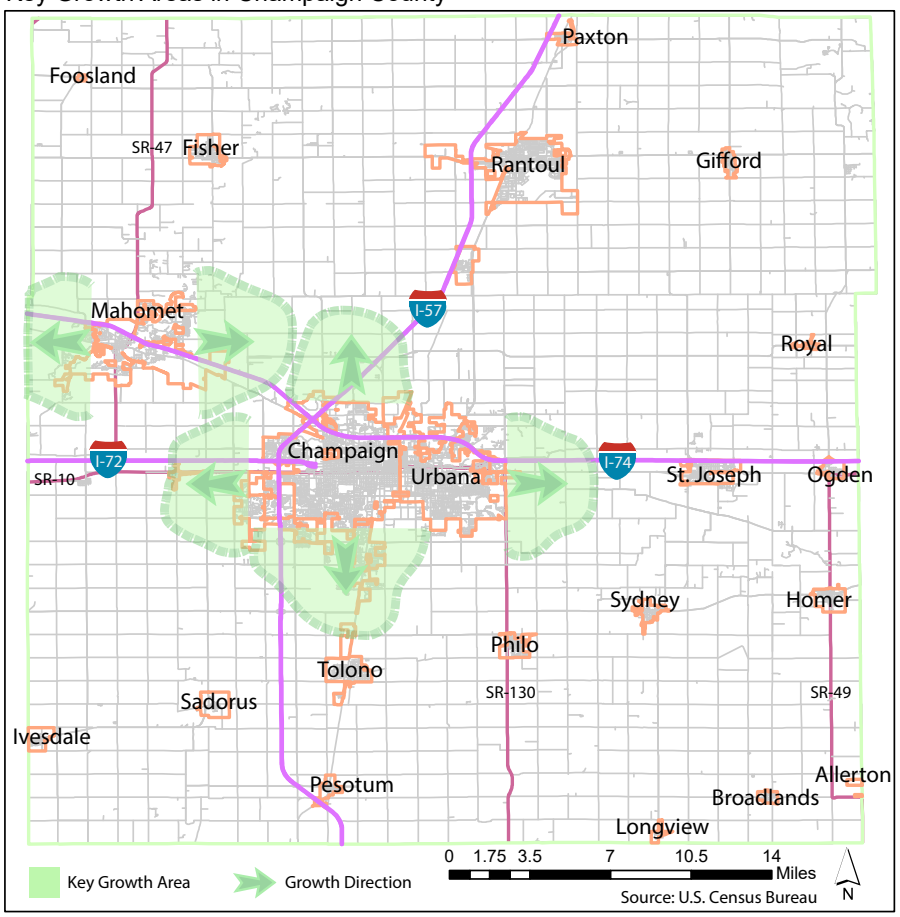
Project Description

This report will tell the reader the suitability of various land types for single family, residential home development. It's important to know the county's soils, slopes, water bodies, and green infrastructure areas as they often constrain development. Theses analyses follow this section on growth patterns.

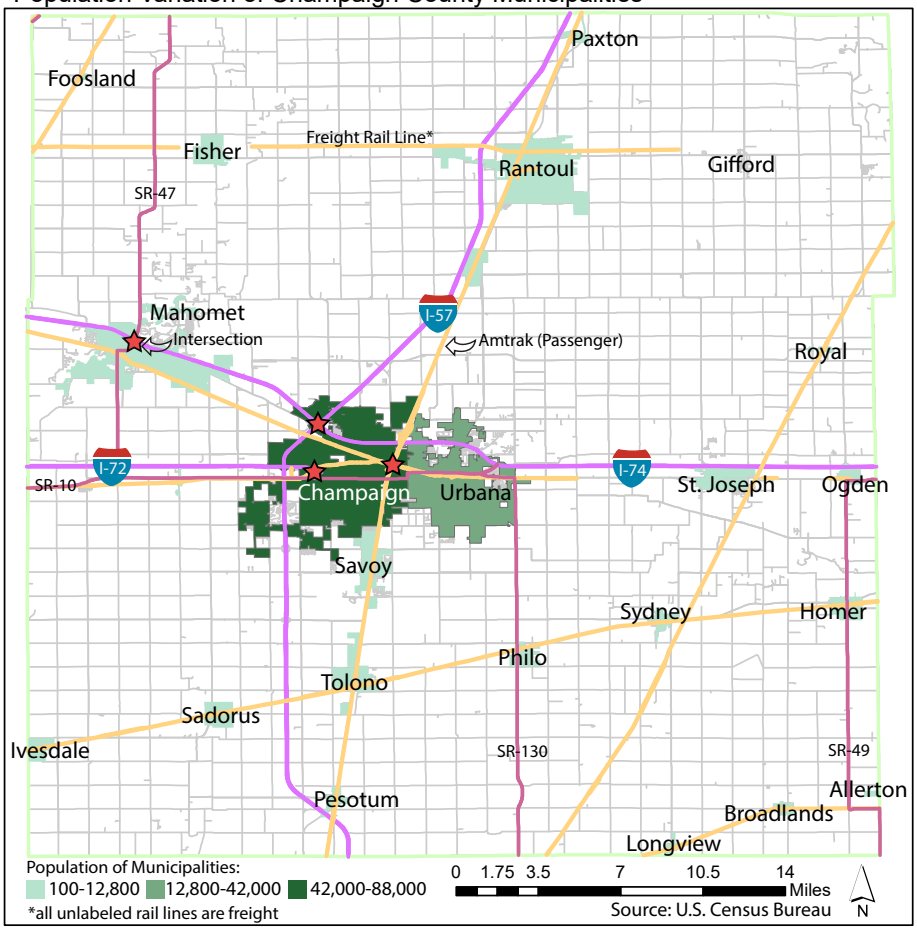
County Growth Patterns

First, it's important to learn the current growth patterns (map to right) and the transportation effects on these patterns (map below). Champaign has the most directional growth which affects the expansion of the other 2 major cities, Urbana and Mahomet. For instance, Mahomet's eastward expansion might be in conjunction with Champaign's northward and westward growth. Urbana's southern growth is in line with Champaign's southern growth.

Key Growth Areas in Champaign County



Population Variation of Champaign County Municipalities



Transportation Effects on Growth

The effects on population variation among the 3 cities are the availability of multiple transportation forms and the intersection of routes. Intersections of freight and passenger train routes in downtown Champaign spurred its domination of the region's growth. Also, I-57 and I-74 intersect in NW Champaign and I-72 stops here. Intersections create natural stops for travelers to buy gas and food, which encourages commerce. Areas close to intersections are desirable for housing as commuters can travel to multiple destinations quickly from their neighborhood. Since Urbana and Mahomet have less intersections of highways or rail lines, they experienced less growth. Citing new, residential homes close to existing transportation and adjacent to current growth patterns reduces uncertainty in return on development investment.



Soil and Slope Suitability Analysis

Introduction

Slope and soil data were gathered for Champaign county to analyze residential development suitability. Information was categorized from unsuitable to highly suitable according to these 2 categories' ability to handle construction. Results show most areas in Champaign county as unsuitable for development, requiring major modification for construction. Yet, select locations offer prime development potential, which saves the investor significant costs.

Method

Slope and soil suitability used different methods to manipulate data. Three slope percentage categories (highly suitable, suitable, and not suitable) were created from the data to find out the expense of developing when ponding, water conveyance, and ground frost become issues as slope increases. Soil types were rated for soil suitability based on their ability to structurally handle new dwellings and streets. Since an area generally consists of 3-mixed soil types, called a soil series, the overall soil suitability analysis looks at the *soil series* rating. This is a composite score of the 3 soil types that create the series. Soil series' suitability were also divided into highly suitable, suitable, and not suitable categories.

Data were divided into 3 slope categories, 0-1% and >5%, 1-2%, and 2-5% to determine ponding, water conveyance, and ground frost issues that limit construction (see Attachment A). Slopes of 0-1% have poor drainage due to limited water conveyance ability and are expensive to develop. Ponding on sidewalks and roads become safety issues. Terrain surrounding a home at this slope will not drain water away from foundations, increasing likelihood of flooding and building-structural problems. Slopes of 1-2% allow more drainage and are suitable for development. They require less grading to convey water off of streets and away from buildings so are less expensive to develop. Yet, 2% slope is ideal where ground frost is an issue. Slopes of 2-5% are the least expensive for construction in that they provide optimal slope percentage for drainage. Lastly, slopes of greater than 5% require much earthwork as streets are required to switchback up slopes and much cut and fill operations are required. Parking at this slope must be terraced with retaining walls as lots or provided in expensive parking decks.

Soil analysis includes scoring both soil type and soil series for its development potential. The ability of dwellings with basements, dwellings without basements, and streets to be constructed on a soil type determines the soil type's total suitability ranking (See Attachment B). Both of these housing types and streets are vital for subdivision development to give potential residents housing choices and sufficient road infrastructure. Soils where it's difficult to construct dwellings with basements due to shrink-swell potential were given a 1, while optimal soils were given a 3. Dwellings without basements are also scored and are less rigid in construction limitations. Soils that are not structurally sound for street base layers and do not have optimal vertical load capability for vehicles are given a 1, where a 3 score indicates a strong soil. For example, Ashkum soil is unsuitable so its total score of 3 comes from a 1 score in each of the three categories. The composite soil series score consists of the added rankings of its 3 soil types (see Attachment C). For instance, the IL-12 series adds Drummer's total score (3), Plano's (5), and Elburn's (3). Both soil types and soil series were divided into highly suitable, suitable, and unsuitable categories. These criteria create a soil suitability map (Attachment D).

Results and Analysis

Overall trends can be seen in slope suitability analysis, which allows for development recommendations. Most of the county is very flat, consisting of slopes between 0-1% (see attachment A).

Thus, much grading would be required for surfaces such as sidewalks and streets to adequately drain in potential residential areas. The largest continuous landmass that is suitable radiates from Mahomet. Upper, middle class single-family homes could be developed here due to demographic trends, and land here can be less expensively developed pertaining to slope analysis. The land around Champaign, Urbana, and Mahomet is suitable for development. Investment in new construction here would compete with numerous developers. Therefore, it's advised to take advantage of less populous areas where slope is suitable for development. These include a large band between Ludlow and Rantoul, a large area to the southwest of Gifford, and bands around Philo and Sydney.

The majority of Champaign County is also unsuitable for residential development in terms of soil analysis. Most soil series received a score of 9-11, indicating poor structural capabilities (see Attachment C). Yet, there are large suitable areas west of Mahomet and north of Sydney. There is a large suitability band near Fisher and northeast of Gifford. If we combine analysis of the two maps, A and D, we see the most suitable areas to the west and north of Mahomet as well as the band north and east of Sydney. These two areas of Champaign County should be the first to be developed for residential opportunities where cost is a concern. These locations consist of Catlin-Dana-Tama, Miami-Strawn-Hennepin, and Morley-Markhum-Ashkum series (see Attachment E). Thus, these series are most suitable for development and should be made a note of when looking to develop similar soil series outside of Champaign County.

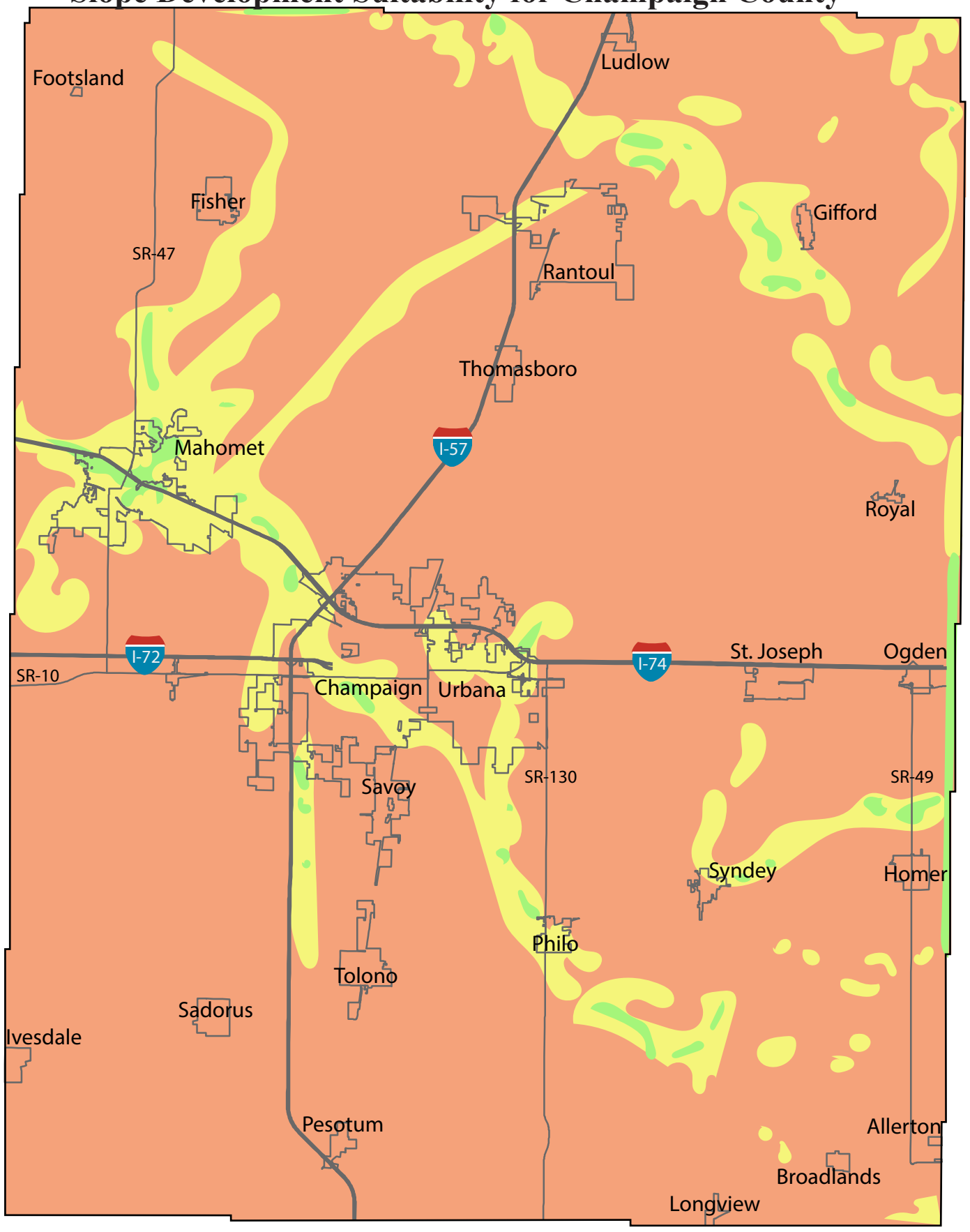
Conclusion

An analysis of slope and soil characteristics of Champaign county yields different areas of various suitability potential for residential development. While there are distinct, suitable areas to be focused on for construction opportunities, Champaign County is overall unsuitable for development, requiring major cost to build in most areas. The reader should take into account the extensive data categorization and analysis of slope and soil in order to make informed, cost-based decisions on where to site residential development in the county.

Connection to Water Analysis

The reader will see a parallel between the soil and slope analysis and the water analysis in the following section. For instance, while some areas close to rivers and water bodies may have slope more suitable for development, they should not be developed as they would be in stream or lake buffers. However, land farther from the stream that slopes up to the plains and cropland area may be suitable. The water analysis that follows this section will discuss which areas to avoid building in respect to avoiding flood zones and encroaching on pristine water bodies' ecologies.

Slope Development Suitability for Champaign County



Attachment A

Attachment B

Soil Name Rating by Development Potential

Soil Name and Description		Rating of Potential Dwelling or Street Development			
Soil Name	Development Potential Strengths/Weaknesses	Dwelling w/ Basement	Dwelling w/out Basement	Streets	Composite Score
Ashkum	Severe: ponding, low strength	1	1	1	3
Blount	Severe:low strength	1	1	1	3
Beecher	Moderate: somewhat poorly drained	2	2	1	5
Bryce	Severe: low strength, shrink-swell	1	1	1	3
Catlin	Moderate: shrink-swell, low strength	2	2	1	5
Dana	Moderate: shrink-swell, low strength	2	2	1	5
Drummer	Severe: ponding, low strength	1	1	1	3
Elburn	Severe: wetness, low-strength	1	1	1	3
Elliott	Severe: wetness, low-strength	1	1	1	3
Flanagan	Severe: wetness, low-strength	1	1	1	3
Hennepin	Slight: very well-drained	3	3	3	9
Markham	Moderate: moderately well-drained	2	2	2	6
Miami	Moderate: shrink-swell, low strength	2	2	1	5
Mokena	Severe: poorly drained	1	1	1	3
Morley	Moderate: low strength, shrink-swell	2	2	1	5
Plano	Moderate: shrink-swell, low strength	2	2	1	5
Strawn	Slight: shrink-swell	3	3	3	9
Swygert	Severe: shrink-swell, low-strength	1	1	1	3
Tama	Slight: well-drained	3	3	1	7
Varna	Moderate: shrink-swell, low strength	2	2	1	5

Dwelling and Street Development Potential Rating: 1 = Poor, 2 = Moderate, 3 = Optimal

Description Note: Severe = poorly suitable, Moderate = suitable, Slight = highly suitable

Composite Scores:

Score of 7-9	= Highly Suitable soil for development
Score of 4-6	= Suitable soil requiring some modifications for development
Score of 3	= Unsuitable soil requiring major modifications for development

Attachment C

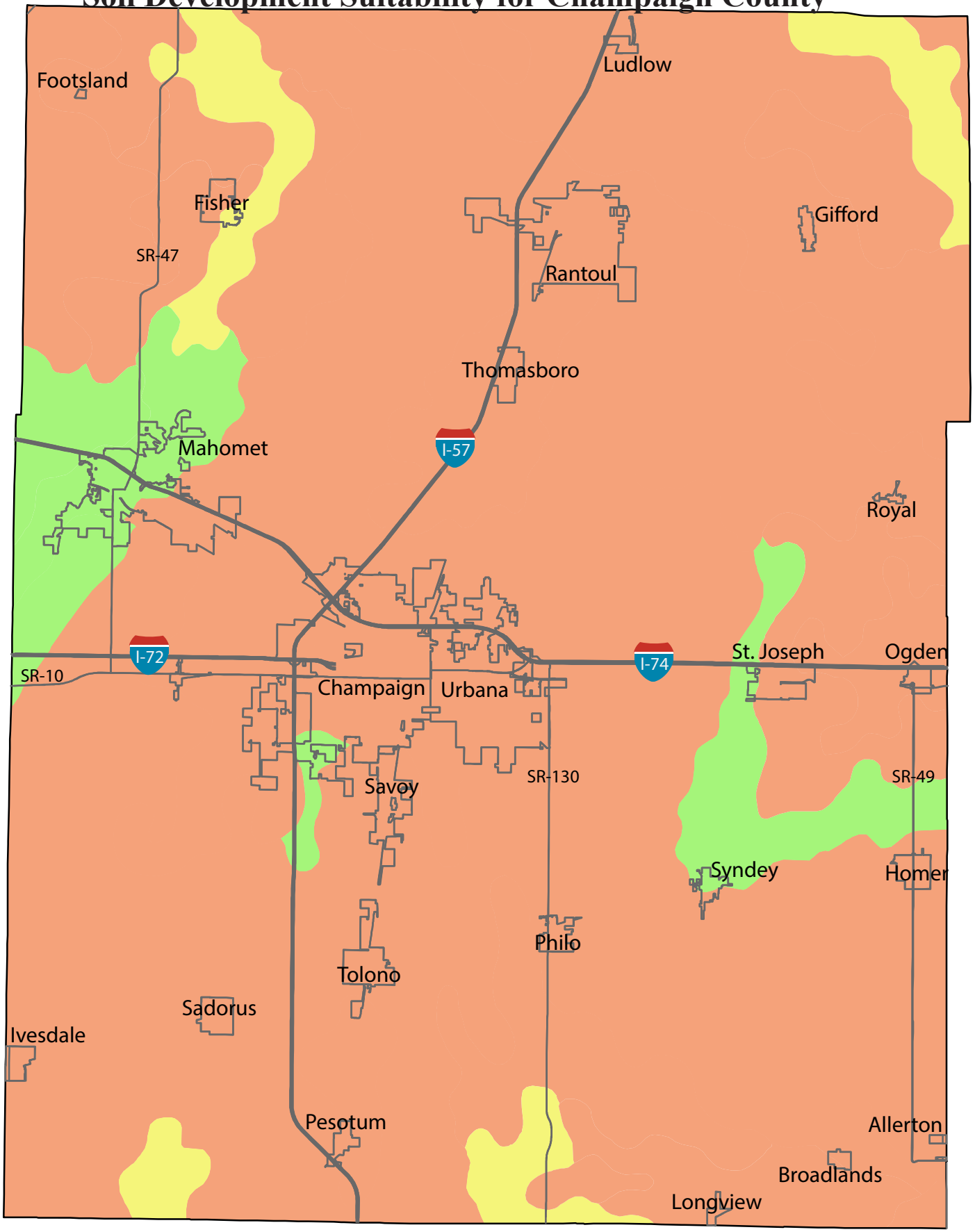
Soil Series Rating by Development Potential

Series Number	Series Components	Rating Calculations	Composite Rating
IL-10	Flanagan-Drummer-Catlin	3+3+5	11
IL-12	Drummer-Plano-Elburn	3+5+3	11
IL-14	Varna-Elliott-Ashkum	5+3+3	11
IL-16	Swygert-Bryce-Mokena	3+3+3	9
IL-18	Bryce- Swygert	3+3+3	9
IL-44	Morley-Blount-Beecher	5+3+5	13
IL-46	Miami-Strawn-Hennepin	5+9+9	24
IL-48	Morley-Markham-Ashkum	5+6+3	14
IL-73	Catlin-Dana-Tama	5+5+7	17

9-11 rating	= Unsuitable, requiring major modifications to develop
12-14 rating	= Suitable, requiring some modifications to develop
>15 rating	= Highly suitable soil to develop

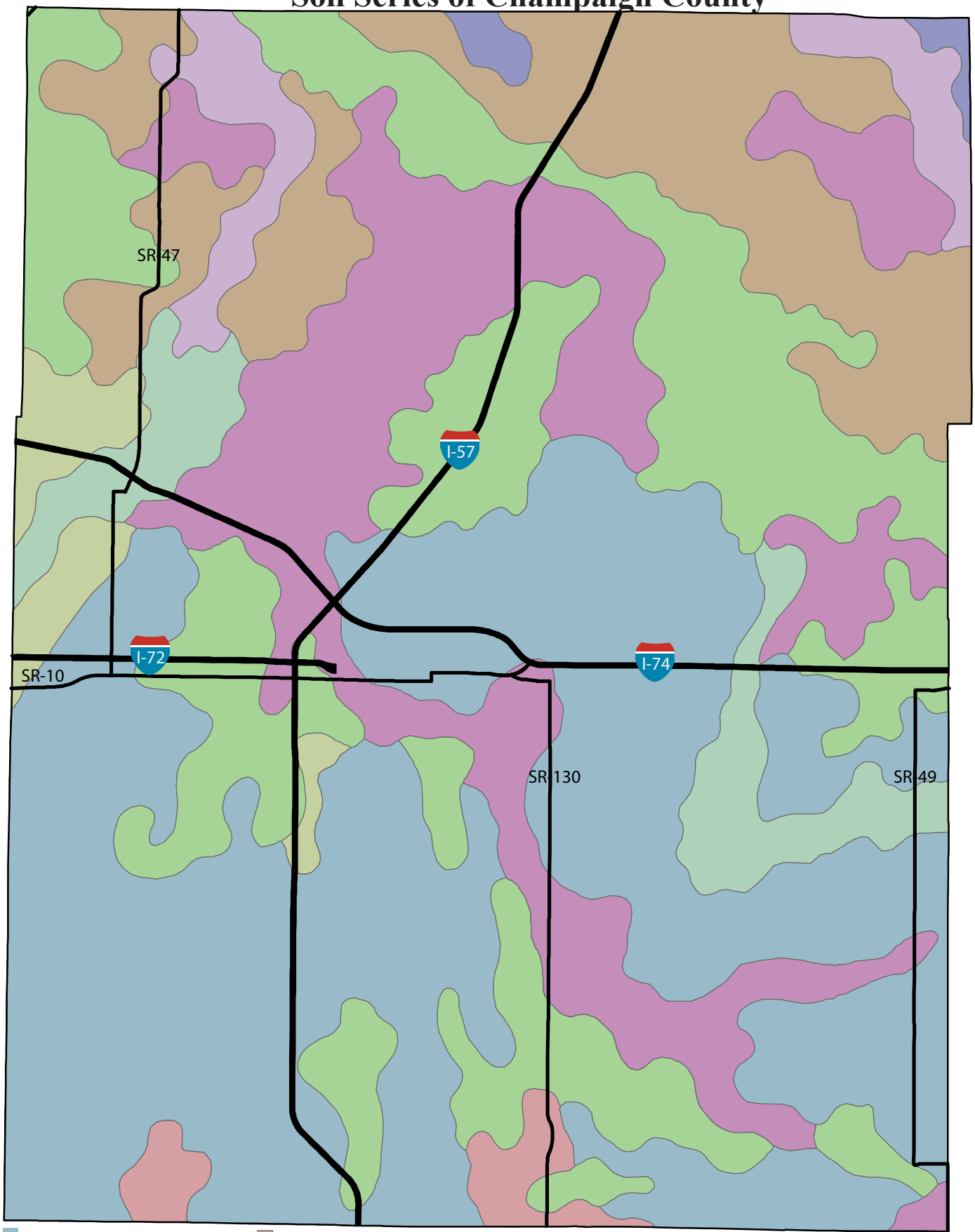
Soil Development Suitability for Champaign County

Attachment D



Soil Series of Champaign County

Attachment E



Data: U.S. Census Bureau

Introduction

A study analyzes suitable land for residential development by following 2 criteria - it must be clear of a floodplain, the 100-year and 500-year flood area as defined by FEMA, and it must not be in a restricted land cover. Land such as natural areas that perform ecosystem services should be conserved while cropland is deemed suitable for development. When siting new homes at the neighborhood scale, a smaller, 1 mile by 1 mile study area is important to analyze. This allows for an in-depth study of how rainfall events may affect individual home placement.

Methods for Water and Land Cover Plan Creation

Methods for compiling data for water-area restrictions on development included displaying stream and lake buffers as well as flood zones on a map (See Attachment A). Seventy-five foot buffers were placed around streams and lakes where development is prohibited and added to the overall stream or lake color on the map. This is due to municipalities' placing restrictions on development inside stream or lake buffers. Areas around natural water bodies filter pollutants and keep the water clean for recreational activities such as swimming. Streams and lakes percolate to aquifer groundwater, from which many cities draw their drinking water. Lastly, the addition of 100-year and 500-year floodplain areas to prohibited areas in blue is important to keep potential dwellings and streets from being sited in flood-prone locations.

Various land cover types were displayed as either unsuitable or suitable depending on the land cover type's conservation value (See Attachment A). For instance, evergreen and deciduous forest are highly valued for conservation so are shown as not suitable for development as they are to be preserved. They create wildlife corridors, sequester carbon, and provide aesthetic value for nature enthusiasts. Prairie, native to Champaign County, holds high conservation value in the tall grasses' ability to filter toxins from non-source pollutants such as adjacent cropland fertilizer. The tall grasses also replenish soil fertility and are what created rich soil in the Midwest. The largest area that is deemed suitable for development and not for conservation is cropland. Although farmland has a purpose in providing ethanol fuel, the other areas such as forest or prairie land were more important ecologically for conservation. There is also much less of these natural areas than cropland, so they are deemed more fit for conservation.

Water and Land Cover Suitability Analysis

The reader sees that most of Champaign County is suitable for development under this criteria, with some unsuitable areas (See Attachment F). Large areas to avoid are flood plains of several rivers to the west of Royal, to the west and south of Champaign, to the west of Longview, and central Mahomet where forest preserves and parks create a chain of natural areas. The large floodplains of rivers in Champaign County are due to its elevation. Since Champaign County is low-lying and areas do not drastically increase in slope, rainfall does not travel far from where it falls.

Forest, prairie, and field windbreaks also should be preserved. The forest and prairie land marked for conservation (in red) occurs in agglomerations to the south of Urbana, the east of Rantoul, and west of Savoy and provide important ecosystem benefits such as wildlife habitats and mitigation of extreme temperatures. The red grid patterns seen crossing cropland that encompasses most of the county are farmers' rows of trees between fields (See Attachment F). These trees should be preserved as they act as windbreaks to stop wind erosion of soil.

Development should take place close to large cities such as Champaign, Urbana, and Mahomet for two reasons. Siting developments on infill sites can reinvigorate neighborhoods where dilapidated buildings increase crime and decrease appeal for investors. At times, infill developments may hook up to existing infrastructure onsite, reducing cost. New infrastructure such as stormwater pipes, streets, and electric lines are expensive. If infill development is not possible, placing development close to neighborhoods with existing infrastructure decreases the length of extending these services to new home owners.

Water Movement Analysis

A mile by mile study area was undertaken to understand the flow of water in Champaign County (See Attachment G). It's important to consider water flow at a smaller scale and slope analyses is better facilitated on smaller maps. The water flow of the study area follows predictable patterns.

A study area is important for a variety of reasons. A map at a large scale shows only water flow at a regional level. For instance, water flowing from small creeks and tributaries downhill into larger rivers can be seen in a regional map, but individual rainfall events' water conveyance are not shown. These rainfall events are important for homeowners to know how potential flooding might affect where they should site their home against a hillside, so as not to be in the center of a swale that conveys water to lower elevations.

Slope can also be analyzed in a smaller map, with 1 or 5 meter contours clearly shown. A potential homeowner can see how water and flash floods may affect their plot if they are looking at a smaller, site map. Their home is more visible against nearby slopes that can be analyzed for downhill creep. Vegetation type often depends on slope analysis of site-scale maps, such as certain trees and shrubs that only grow on certain faces of a slope or at various elevations. Ecologists' analyzing wildlife that is endemic to specific plant types would do well to consider the slopes seen at smaller maps.

The flow pattern of the study area is predictable (See Attachment G). The conveyance occurs down swales that are adjacent to nearby ridges. The swales channel water that falls at highpoints toward the floodplain that is between Champaign and Mahomet. Any homes sited in this study area should not be placed within swale lines nor in low-lying areas to the southwest of the study area, since this is near the floodplain mentioned.

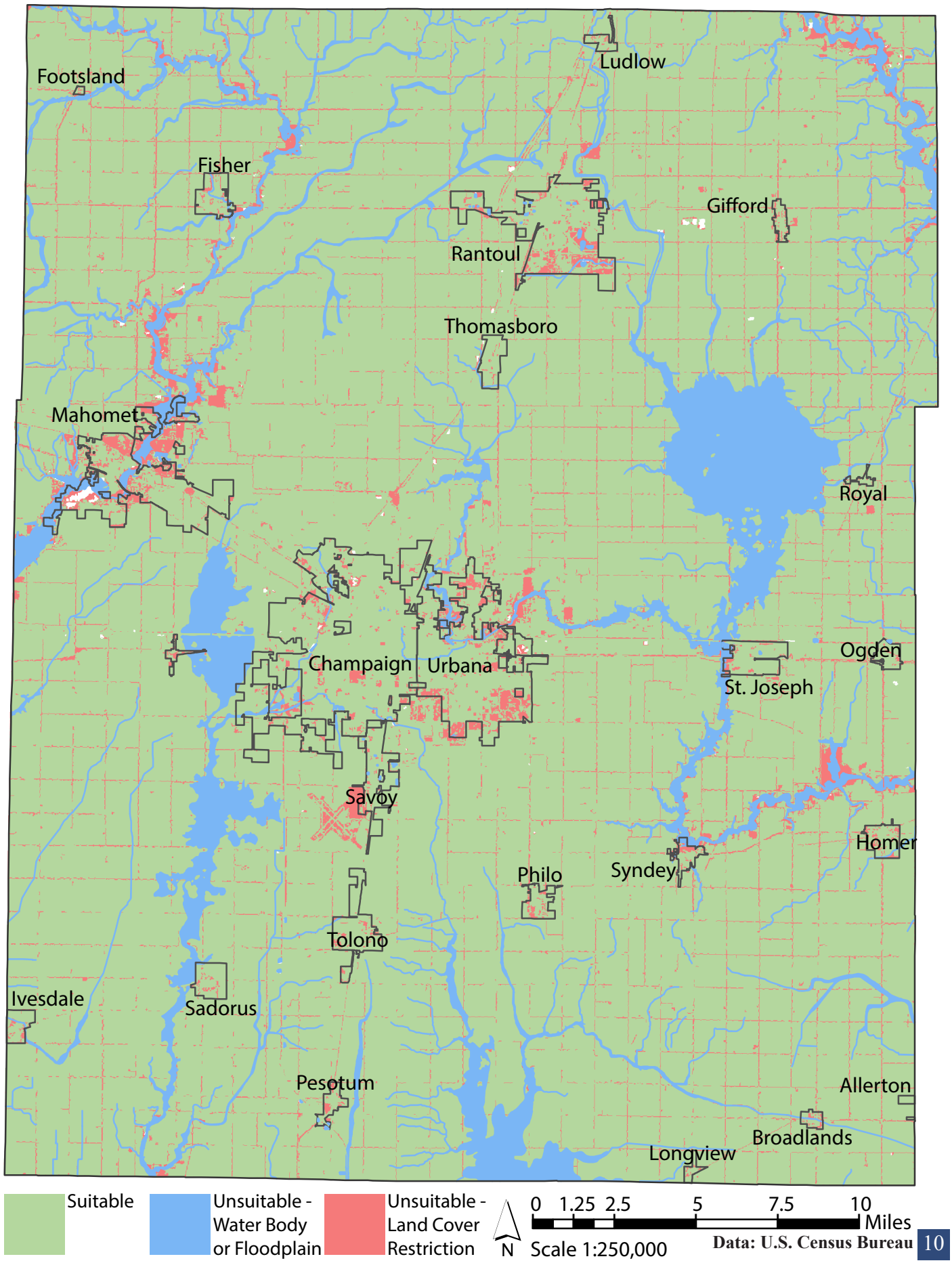
Conclusion

Natural water bodies and land cover play important roles in sighting new developments. It's imperative that new homes not be sited within floodplains nor near water bodies. Land cover such as forest, prairie, and other natural areas should be conserved while cropland is deemed suitable for development. When looking at development of residences at the neighborhood level, a smaller map is warranted. This allows for an in-depth study of how rainfall events may affect individual home placement.

Connections to Green Infrastructure

Water bodies are important to conserve for development, not just due to their being prone to flooding, but they also perform many ecosystem services. The following section discusses areas of Champaign County which should be preserved due to being ecologically vaulable. As the reader will see, those areas in the county often overlap with lakes and streams outlines in this water suitability analysis.

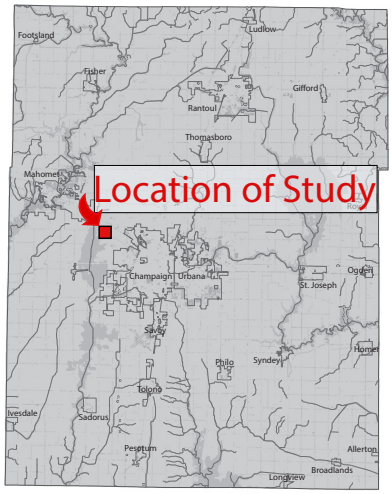
Suitable Land for Development in Champaign County



Attachment F

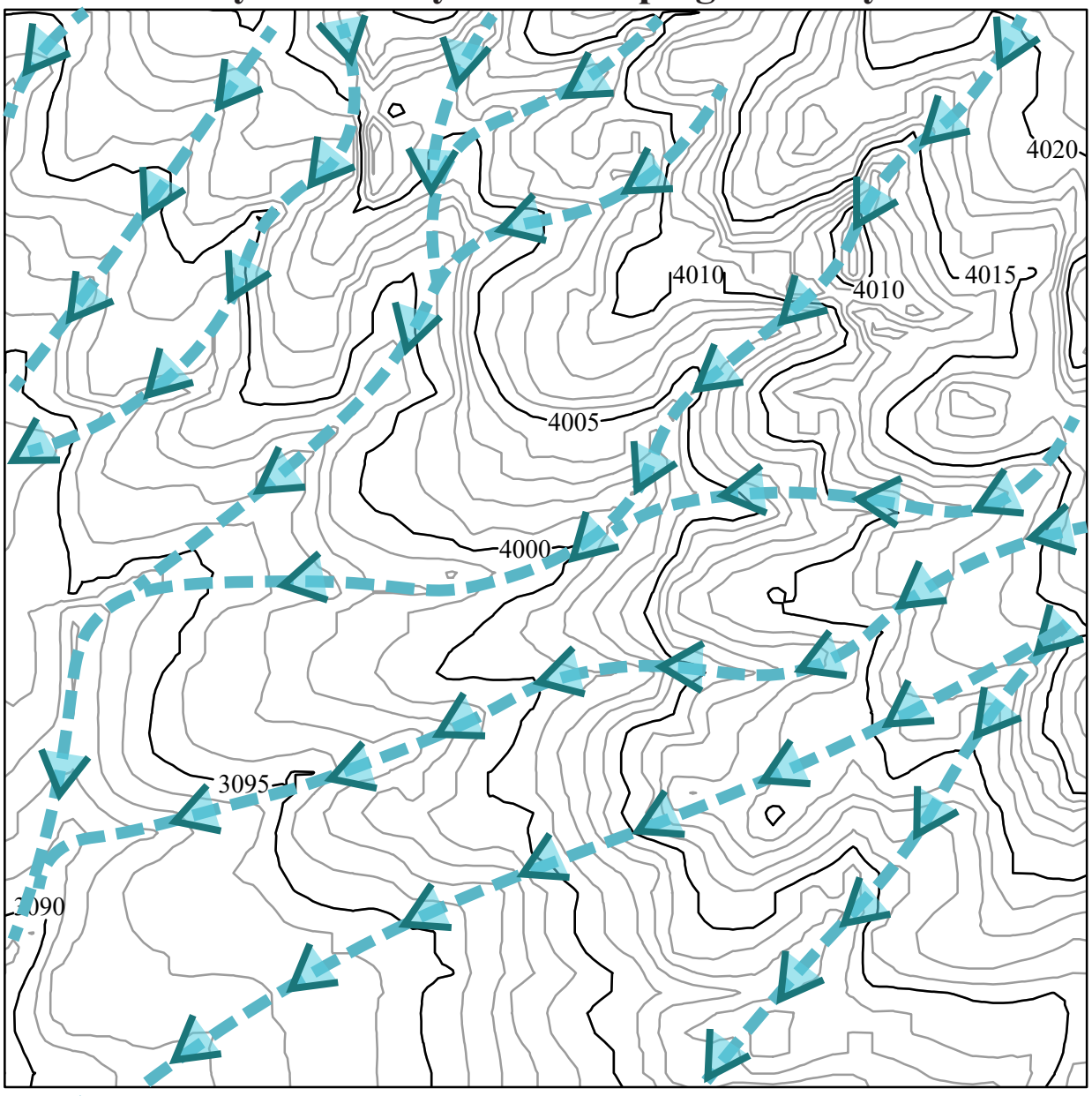
Site Location

The site selected for a water conveyance study lies on the corridor between Mahomet and Champaign. It is close to a floodplain to the southwest of the study area. The site is entirely surrounded by cropland, typical of the county.



The location was selected for two reasons. The proximity to Mahomet and Champaign make it a good target area to study conditions that may also be present in these two adjacent cities, such as similar slopes or time water takes to drain off of a site. The second reason for selection is the location was deemed moderately suitable for development by an earlier study.

Water Conveyance Study for Champaign County



Attachment G

Introduction

Green infrastructure has enormous ecological benefits and should be preserved from development. Data created 2 plans in the evaluation of green infrastructure in Champaign County. These maps (Attachment H, I) and their accompanying table (Attachment J) rate green infrastructure value of features such as rivers and croplands and give a basis for locating residential development. While most of Champaign County is suitable for development due to being a low ecological value (EV), the high EV areas such as rivers, water bodies, forests, and prairies should be preserved from development.

Green Infrastructure Suitability Analysis

It's vital to preserve green infrastructure as it performs an array of ecosystem services for a community through its corridors, hubs, and nodes. It's able to provide these functions due to its being a system of interconnected greenways, parks, and open natural areas. These connections are called corridors such as rivers' connecting lakes or riparian forest preserves and are important to preserve because they provide safe travel for wildlife to various hubs and nodes. A hub is a large, multiacre tract such as a forest or prairie preserve that provides habitat for animals due to its diversity of food types (plants or prey) and shelter. For instance, certain animal species will only make shelter in certain tree species or feed on certain prey or plants. Destruction of habitat worldwide is a large cause of species' extinction. A node is a smaller habitat area such as a neighborhood park that is connected to larger hubs through corridors.

Green infrastructure is sensitive to development and thus should be preserved. Yet, siting residential development next to preservation areas has benefits. A sprawling subdivision sited in a pristine forest would take away much habitiat area. Also, new roads that are spread across a large area cut off corridors, such as neighborhood streets that make it difficult for deer to cross. Residential development should follow a cluster style, with closely grouped homes in a small footprint of the tract of land. This allows most of the land to be preserved as nature preserves and reduces habitat fragmentation as fauna generally need large, coherent areas as habitat. Pervious trail systems may go through the natural area from the new clustered subdivision, increasing the price at which developers can sell lots due to the attractiveness of living close to nature. This low-impact development method is good for ecology and economy.

Data were collected from the U.S. Census Bureau and analyzed in a table (See Attachment J). Layers such as community parks, prairies, and land covers such as residential development and row crops were rated 1-3 depending on its ecological value (EV) in various categories. For instance, row crops which cover most of the county were given a low, total EV due to their low ratings in various categories. Row crops do not provide significant habitat due to non-diverse plant types, do not filter pollutants and in fact are the cause of many nonpoint source pollutants such as nitrogen's running off cropland and into streams. They also provide no human-recreational value. Rivers, prairies, and forests scored high in all categories. The UIUC campus and neighborhood parks provide some EV such as recreational opportunities but provide habitat for only several species, such as rabbits, squirrels, and sparrows.

The data created maps to discern ecological value and development suitability (See Attachment H) and outline hubs, nodes, and corridors (See Attachment I). The reader sees that most of Champaign County, being row crops, has low ecological value and is suitable for development. The areas with high ecological value consist mainly of buffer areas along rivers and lakes. These areas should be preserved along with community parks and the UIUC campus quads, which provide medium EV. Important hubs that the maps outline include a river

convergence area with Middle Fork River Forest Preserve to the northeast of Gifford, a chain of river-forest preserves along the Sangamon River in Mahomet, and the area to the east of Pesotum where the east and west branches of the Embarras River converge. Examples of corridors in Champaign County include the path running from St. Joseph to Champaign-Urbana or the path from Mahomet to Fisher (See Attachment I).

Potential Value of Green Infrastructure

Areas of highest EV consist mainly of rivers and their buffers, which provide many ecosystem services. River buffers such as prairie grasses, willow or birch trees filter pollutants such as fertilizer from cropland or gasoline and oil from streets that may enter the stream. This is important as pollutants find their way to the Gulf of Mexico and contribute to deoxidation of the ocean here through algae blooms, which supplant wildlife due to the newly unlivable aquatic environments. Rivers and water bodies also provide recreational activity such as boating or hiking along the shore. They provide habitat for migrating geese, ducks, cranes, and pelicans as well as river otter, fish, bald eagles, and red-tailed hawks. Forest preserves and prairies also provide the same functions, without an emphasis on water quality.

Areas such as community parks, quads of the UIUC campus, and greenways provide vital human and some ecological services. They provide opportunities for sporting events or places for community organization. They are a safe place, free from vehicle traffic to congregate and provide a connection to nature that helps destress city dwellers. Greenways are important alternative transportation options for cyclists who can commute to work. The EV of these land use types are moderate: they provide some habitat for squirrels and birds, but due to most plant types being turf grass (sometimes sprayed with pesticide and fertilizer), there are pluses and minuses to the management of these types of landscapes.

Evaluating the Value of Green Infrastructure

There are numerous ways that types of green infrastructure can be valued. Homes next to forest preserves and prairies are typically more expensive and appreciate in value compared to other locations. Sites of medium EV such as athletic fields and neighborhood parks bring in revenue from youth sports leagues, community events, and equipment rentals (pavilion rental, bicycle rental, etc.). Rain gardens, bioswales, and other features that both filter and retain stormwater save the cost of increasing the capacity of existing “grey” systems such as concrete stormwater pipes when installed in new subdivisions.

Conclusion

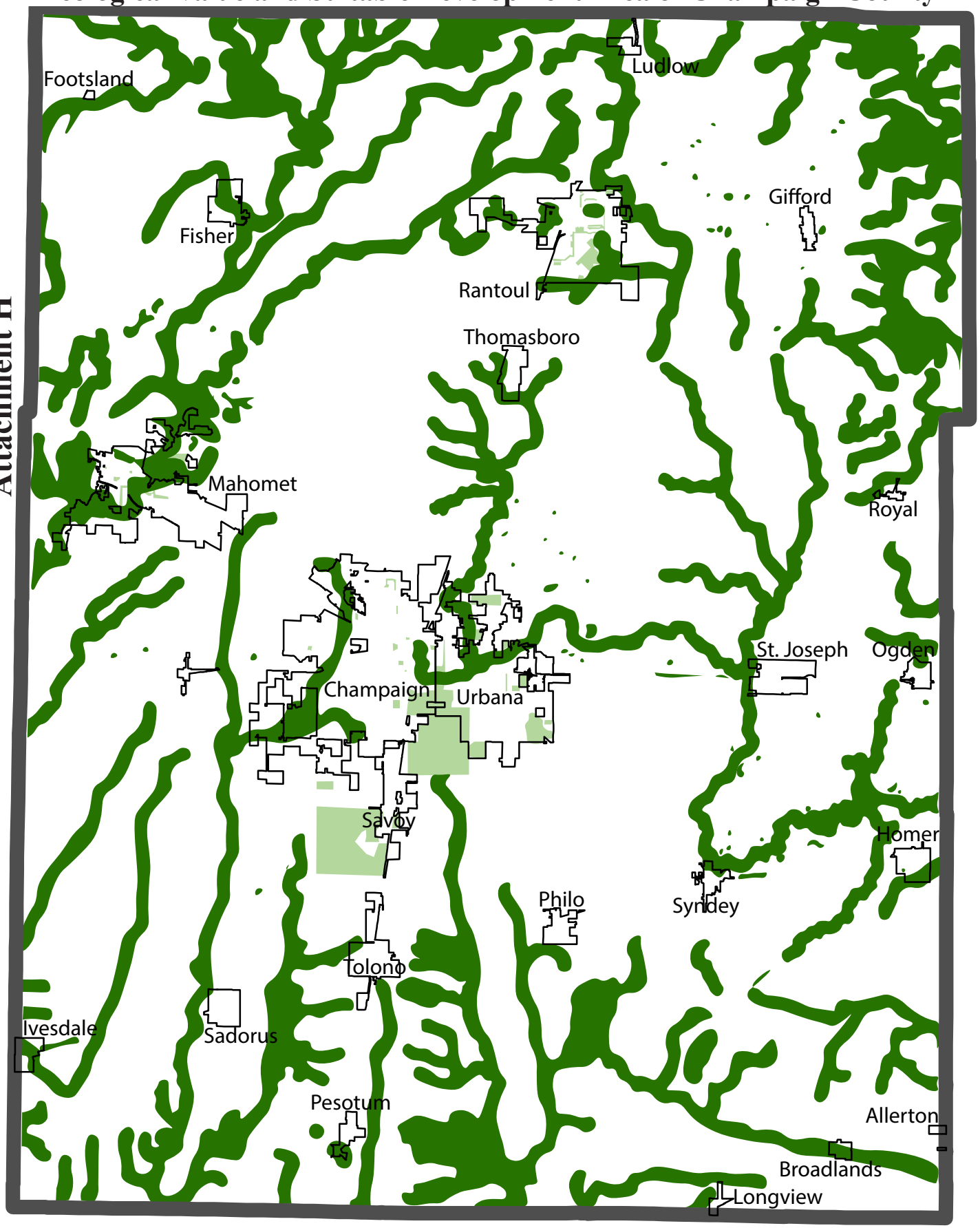
Two plans were created in the evaluation of green infrastructure in Champaign County. These maps and their accompanying table (Attachment J) rate green infrastructure value of features such as rivers and croplands and give a basis for locating residential development. While most of Champaign County is suitable for development due to being a low ecological value, the high EV areas such as rivers, water bodies, forests, and prairies should be given conservation status.

Connections to Composite Analysis

Green infrastructure is important to conserve and its layer is given a certain weight, or importance, in determining where is suitable to build when looking at the composite analysis. Green infrastructure should not be developed as it provides vital ecosystem services. It also increases the home values of developments near parks, forest preserves, and other natural areas.

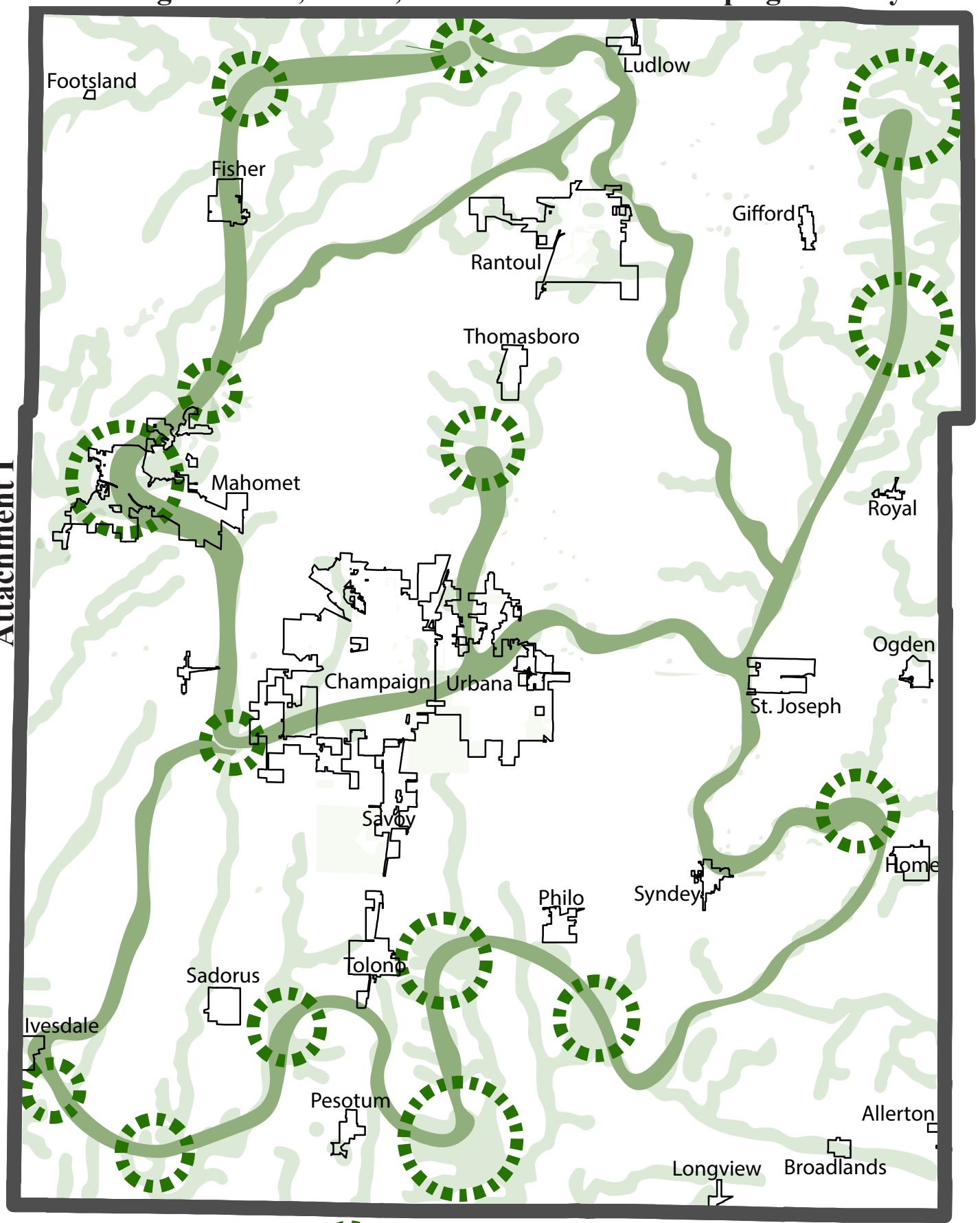
Attachment H

Ecological Value and Suitable Development Area of Champaign County



Ecological Hubs, Nodes, and Corridors of Champaign County

Attachment I



Attachment J

Green Infrastructure Ecological Value (EV)

Green Infrastructure Type	Category Ecological Rating (1-3)					Total EV
	Wildlife Habitat	Wildlife Corridors	Stormwater Retention	Stormwater Filtration	Recreational Opportunities	(5 Added Categories)
Water Bodies - Streams & Lakes	3	3	3	3	3	15
Greenways & Trails	1	3	2	1	3	10
Regional Airports	2	1	3	3	1	10
Community Parks	2	2	2	2	3	11
UIUC Campus	2	1	2	1	3	9
Prairies (IDNR*)	3	3	3	3	3	15
Nature Preserves (IDNR)	3	3	3	3	3	15
Lancover:						
Low-Density Residential	2	1	1	1	2	7
High-Density Residential	1	1	1	1	2	6
Commercial-Industrial-Transportation	1	1	1	1	1	5
Bare Rock, Sand, Clay	1	1	1	1	1	5
Deciduous Forest	3	3	3	3	1	13
Evergreen Forest	3	3	3	3	1	13
Grassland	3	3	3	3	1	13
Pasture/Hay	2	2	2	2	0	8
Row Crops	1	3	2	1	0	7
Urban, Recreation Grasses	3	3	3	3	2	14
Woody Wetlands	3	3	3	3	1	13
Herbaceous Wetlands	3	3	3	3	1	13

Low Ecological Value: 5-8

Medium Ecological Value: 9-12

High Ecological Value: 13-16

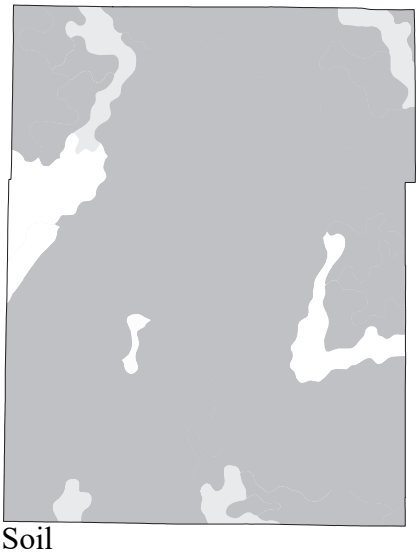
* Preserve of the Illinois Department of Natural Resources

Method

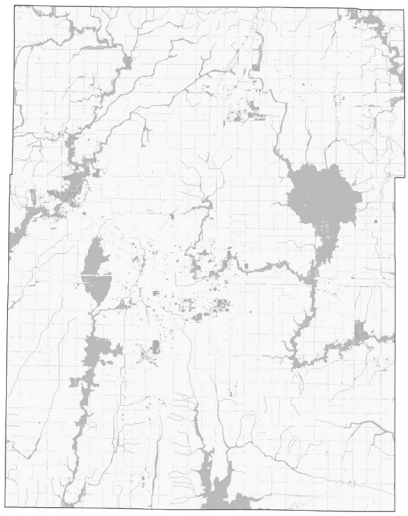
Four maps previously discussed, slope, soil, water, and green infrastructure, were changed to grayscale (see below) to have the coloring be equivalent across all maps. Maps with dark coloring indicate that these dark locations are the least suitable for development such as water bodies and their buffers. Water body and floodplain avoidance is the greatest contraint on development, so this is given a darker coloring in the composite map (Attachment K). It is a safety measure to not locate single family residential homes in floodplains. The next darkest coloring is given to the water bodies' buffers as these are vital for ecosytem services. Finally, slope and soil are given medium coloring. The flat slope of most of the county, while unsuitable, can be modified at a price.



Slope



Soil



Water



Green Infrastructure

Analysis

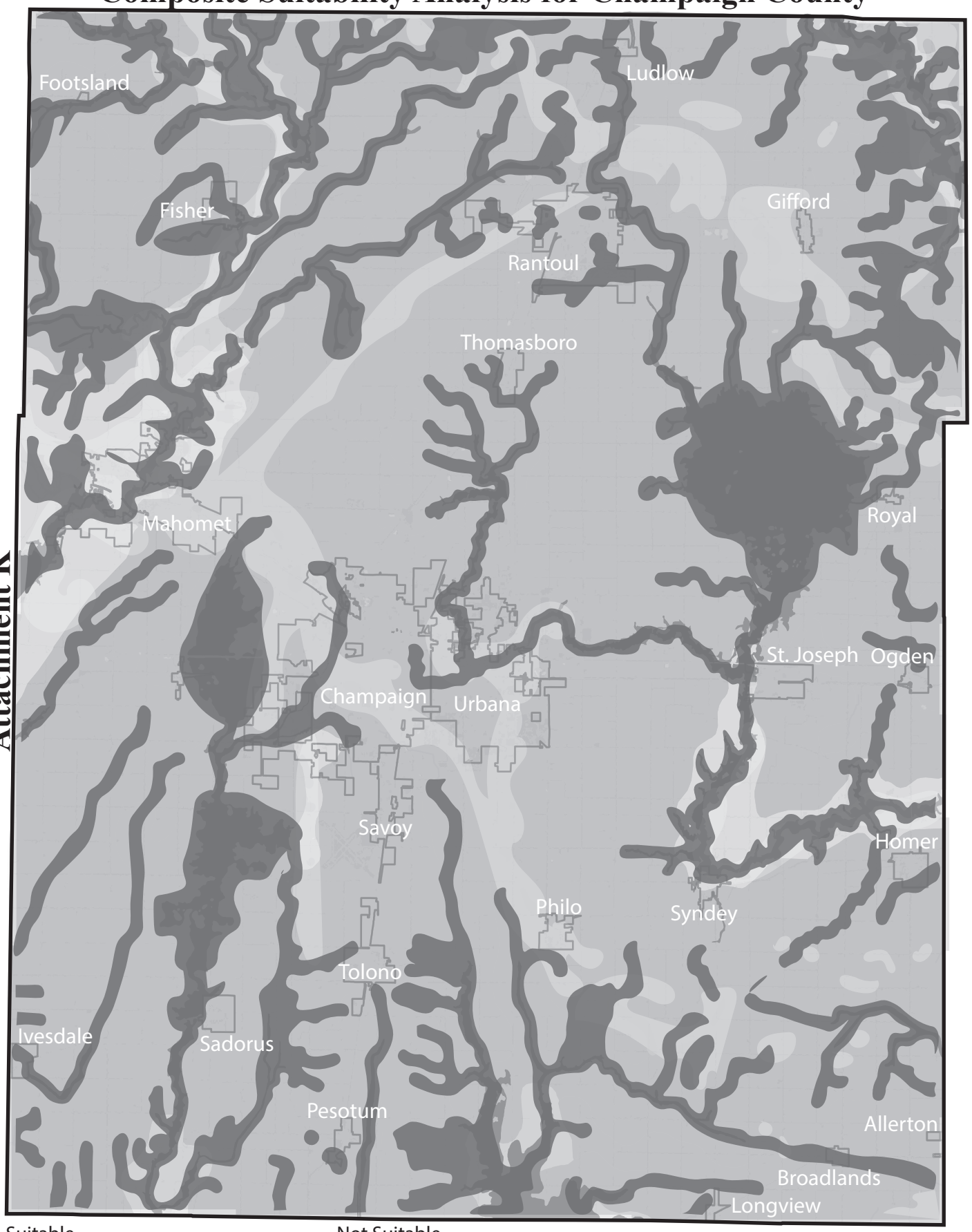
When one views the composite map (Attachment K), they see that there are many water bodies and their buffers throughout the county.

Yet, just beyond the buffers there is land that is suitable for development in regards to all 4 map layers. This is particularly true in locations northwest of Mahomet and north of Sydney. Of these 2 areas, Mahomet should be considered initially for development. It already has a good record of success in developing single family residential neighborhoods. This is likely due to its proximity to the University of Illinois campus. It is close enough for faculty and staff of the university to commute, but far enough to have peace and quiet from the campus. A chain of preserves also runs through Mahomet, making this a desirable place to live near.

It's encouraging that many areas of current significant growth around Champaign, Urbana, and Mahomet are at least moderately suitable for development. There is a stretch between Mahomet and Champaign that should be examined as it appears suitable for development. As a whole, the area around these 3 cities that is moderately suitable may be able to be made more suitable through increased construction cost. For example, providing grading plans for very flat sites is a typical practice.

For Champaign and Urbana, the most promising areas for development are in the north and south of Champaign and in the south of Urbana. To the west of Champaign and the north of Urbana are areas that are unsuitable due to their proximity to water bodies. Development should be prohibited here to preserve these natural areas. Overall, the greatest return on investment due to exiting growth patterns and proximity to the University of Illinois would be the suitable areas surrounding Champaign, Urbana, Mahomet, and Savoy.

Composite Suitability Analysis for Champaign County



Attachment K

Suitable — Not Suitable

N

0 1.25 2.5 5 7.5 10 Miles

Scale 1:250,000 Data: U.S. Census Bureau