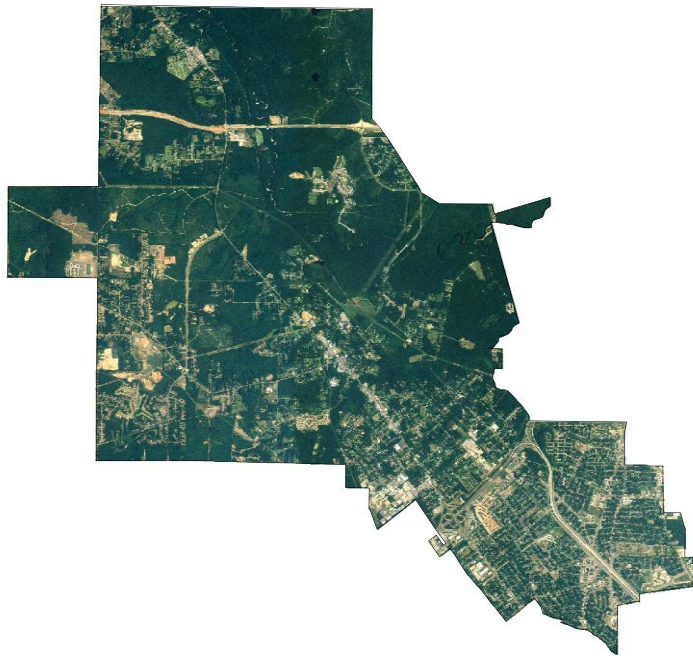


# **A Graphic Ecological Characterization of the Lower 8 Mile Creek Watershed--Prichard, AL**

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## **INTRODUCTION**

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In today's technologically savvy civilization it is easy to see how the rich and unique social, cultural, and natural history of a particular landscape can be lost in the depths of affluent internet sites such as Wikipedia®, QuickFacts®, Encyclopedia of Alabama, and the many other "quick fix", mass information sites on the world wide web. An ex-situ study of Prichard, Alabama reveals no exception to this rule, as can be determined by a simple search on any one of today's popular search engines. This is not to say that websites such as these don't have appropriate uses, only that they are all too often misleading in the "ease" of information obtained about topics and events that could provide subject matter for an entire book on their own. The history of Prichard, according to the Encyclopedia of Alabama, can be summed up in one sentence: *Prichard, Alabama was a once booming, yet segregated community that experienced a massive "white flight" during the civil rights movement of the 1960's, resulting in a long and devastating population implosion, only to recently begin efforts of revitalization and reinvestment into the community.* While this one sentence provides a "quick and simple" historical demographic perspective, it provides nothing of the physical, social, and/or cultural movements in and between these major events that were a part of or apart from Prichard, Alabama as a dynamic and evolving community with a history unlike any other. Just as Gary Nabham describes the loss of history through "cultural homogenization and destruction of natural areas" in his *Cultures of Habitat*, so goes the potential experiential and qualitative memories formed during an in depth, remote study of a site.

Although nothing can substitute an on-the-ground and in-depth physical survey of a landscape, new technologies in geographic information systems (GIS) and remote sensing allows for a broad, regional perspective not readily obtained through a site survey. This report entitled *A Graphic Ecological Characterization of the Lower 8 Mile Creek Watershed--Prichard, AL* is an

attempt to better understand the community of Prichard, Alabama, not by abandoning the benefits of the above described “quick fix” internet sources, but utilizing readily available in depth resources, such as geographic information systems files of natural systems, and assembling the information in a more constructive and informative manner. Through the use of GIS, this report presents a cohesive, structured, and informative analysis of the social, cultural, and natural resources of the lower 8-Mile Prichard, Alabama. Natural systems are explored to present a richness of information to better organize and calculate a structured field investigation of the lower 8-Mile Creek watershed in Prichard, AL (Figure 1).

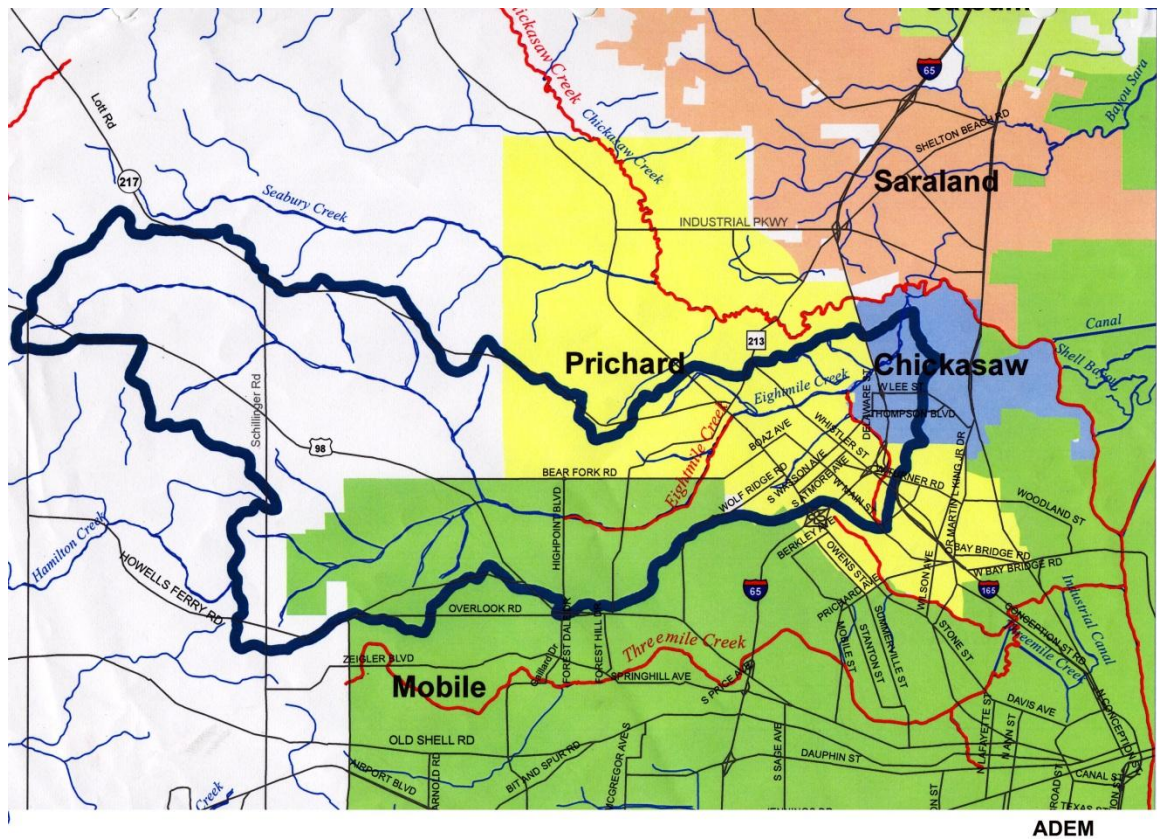


Figure 1--The lower 8-Mile Creek watershed crosses a central portion of the city of Prichard, AL.

## **EXECUTIVE SUMMARY**

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GIS is a site-removed technology that can be used to better understand the landscape and the various elements that form and shape it. The information obtained through this study was ground trothed by field analysis, observation, and interview of the physical site and the people of Prichard. These data are meant to be used to enhance and provide for a better understanding of the historic and present day physical and natural resources that have contributed to the dynamics that form the cultural landscape of Prichard, Alabama. In the very first sentence of her report on embedded memories, Jane Wasserman speaks of memories as those that are “embedded in the cultural landscape”. To better understand what she is implying through this statement, one needs to have a better understanding what she meant by the term “cultural landscape”. The English dictionary, although offering multiple definitions and understandings of the term, describes culture as “an integrated pattern of human knowledge, belief, and behavior that depends upon the capacity for learning and transmitting knowledge to succeeding generations”. Taken with a grain of salt, culture is simply a way of life that is handed down generation after generation. So what is a cultural landscape?

Using the definition of culture, one could infer or imply that the meaning of cultural landscape is that of a way of life that is tied and/or dependent on the natural environment (or landscape) that it is a part of or apart from. So what does the meaning of cultural landscape hold for today’s generation of Prichard citizens, of whom many have the unique ability to trace their lineage and heritage directly to specific African roots? Although there are no longer any living descendants of the slave trade ship the Clotilda, it would be irrational and irresponsible for one to believe that the current culture and cultural landscape of Prichard is not somehow formed and molded in some part from this unique occurrence in American history. However,

this would also make it seemingly that much more difficult to understand how the cultural influence of the original African settlers has influenced the current cultural views, attitudes, goals, and practices of modern day Prichard citizens. This is a question that cannot be answered by the use of GIS. However, by harnessing the understanding that all cultural landscapes are tied to the natural environment that they are built upon, GIS is used to characterize and better prioritize areas that would be of benefit to preserve, enhance, or restore. This in turn promotes the preservation of “memory” in the strictest sense, as the natural and physical environments are the embodiment of historical context (in essence “living” memories).

The GIS data collected through this report is to be used for such a venture and a certain level of hierarchy needs to be placed on the various elements and resources of both the past and present day Prichard in order to determine the order of prioritization. It would be a gross misuse of data and a waste of time to simply designate existing areas of interests and of cultural value for preservation, as this is an implied statement designating the rest of the land as “fair game” for an “anything goes” attitude of land management and planning. Rather, it is suggested that these data be used to map not only areas where preservation may be the right choice, but also to promote a different strategy for development and management of the already existing built environment of the downtown region of Prichard.



## **SIGNIFICANCE OF RESEARCH**

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Evaluation of the 2007 National Land Cover Data (NLCD) coverage for lower 8-Mile Creek watershed in Prichard, AL is approximately 50% urban/suburban residential and 50% forested/pasture, water, and/or otherwise open space. The majority of medium to high intensity developed areas occur, for the most part, within the historic southeast region of Prichard. These areas of development are the areas in which the highest impervious surface ratios occur and the areas that are experiencing the highest degree of environmental impact. *Within Prichard there are more than 3,160 acres of freshwater wetlands and more than 3,714 acres of floodplain. With a total of 16,803 acres of land within the city limits of Prichard, wetlands make up approximately 18% and floodplains comprise of approximately 22% (for a total of 40%). The lower 8-Mile Creek watershed makes up approximately a third of this area. See Appendix B –City of Prichard and Lower 8-Mile Creek Watershed.*

Prichard has three distinct, overlapping geographic corridors of the Coastal Plain-- Alluvial, Alluvial-Deltaic, and Southern Pine Hills and Prichard exhibits characteristics of each within different areas of the city limits. Furthermore, the city is uniquely situated within the boundaries of three distinct Level IV eco-regions. In order from the smallest to the largest, Prichard lies within the Southern Pine Plains and Hills, Gulf Coast Flatwoods, and Floodplains and Low Terraces Level IV eco-regions of the Southern Coastal Plains and Southeastern Plains Level III eco-regions of the Southeastern USA Plains and Mississippi Alluvial and Southeast USA Coastal Plains Level II eco-regions of the Eastern Temperate Forests Level I eco-region. *This is very unique and may mark Prichard, AL as one of the highest areas of biodiversity on the State of Alabama.*

As is the vegetation in this eco-region, the hydrology is equally unique and rare with an abundance of streams and tributaries coursing through the city's watersheds. Although these may be smaller in size than the larger creeks and rivers that they feed into, smaller tributaries like these usually make up more than 70% of a watershed's hydrologic stream network and are often host to a multitude of wildlife and habitats. These systems are also often the primary source of surface water to adjacent freshwater wetlands systems and floodplains that are dependent upon seasonal and infrequent flows for normal function. These wetland and floodplain systems are often referred to as the "kidneys and liver" of watersheds due to their unique abilities such as the storage of large quantities of water during flood events, moderation of peak flows, maintenance of water quality, groundwater recharge, and prevention of channel and bank erosion. The most prevalent and widest ranging watershed within the city limits of Prichard is Seabury Creek Watershed (6,037 acres within Prichard limits), followed closely behind by the *Eight Mile Creek Watershed (5,236 acres within Prichard limits)*.

There are currently (ADEM, 2008 303(d) List three streams that flow through Prichard that are on the Alabama Department of Environmental Management (ADEM) list of impaired waters for the State of Alabama. These streams are the Chickasaw Creek, 8-Mile Creek and Toulmins Spring Branch. As of the 2008 303(d) listing, there are currently not TMDL's developed for any of these waters.

Reading Creek, a small tributary of 8-Mile Creek, has been identified as a potential stream restoration demonstration site for watershed education.

## **METHODOLOGY**

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Methodology of this research included:

- Characterization of the watershed (cultural & physiological)/ literature review
- Building of a GIS
- Selecting, determining and characterizing stream segments (2)
- Reading Creek stream segment
- Eight-Mile Creek stream segment at Crystal Springs Rd & Shelton Beach Rd
- Field Reconnaissance
- Compile and review all data collected
- Analyze and summarize all data
- Recommendation of planning and design strategies

Characterization the lower 8-Mile Creek watershed in Prichard, AL was completed in the office prior to any field work using a literature review and GIS. Characterizing such watershed conditions provides the necessary background data for understanding watershed processes and observed channel forms. It's important to know the geologic, climatic, hydrologic, morphologic and vegetation setting of a stream within its watershed. Geology influences the shapes of drainage patterns, channel bed materials, and water chemistry. Soils influence infiltration rates, erosion potential and vegetation types. Climate affects hydrologic, morphologic and vegetation characteristics. Vegetation affects a variety of factors, including water loss through evapotranspiration, runoff and channel bank and hill slope stability.

Select sample segments were identified by researchers and the stakeholders of this grant. Identified sample segments are the Reading Creek (Reading Park) stream segment and a segment of Eight-Mile Creek at Crystal Springs Rd & Shelton Beach Rd. Both are within the city of Prichard and the lower 8-Mile Creek watershed. These stream segments provide a length of stream that is relatively homogeneous with respect to physical, chemical and biological properties of 8-Mile Creek and its tributaries. Characteristics recorded through graphics and

measurements include stream flow, water-quality characteristics (stemming from substantial changes in upstream watershed characteristics), major hydrologic or geologic discontinuities, such as waterfalls, landform features, major gradient changes and any point-source discharges.

Ground truthing of stream segments was accomplished in 2009 and 2010. Such evaluations are crucial to obtaining accurate field data results that are truly representative of the regional and local watershed conditions. In general, tasks completed during field reconnaissance included: evaluating stream access, observing field conditions, characterizing general reach types, selecting cross-section locations, completing a rough field sketch with location description and just getting a general feel for the stream and its setting. Entire stream lengths were hiked.

Stream systems are often characterized within a spatially nested hierarchical framework that allows researchers to classify streams in a logical manner and identify the spatial scale of inference. For example, to assess the impacts of a stream crossing that contributes high loads of fine sediment to the channel (Reading Creek stream segment), you have to also assess the contribution of sediment from other impacts upstream of the site (Eight-Mile Creek stream segment at Crystal Springs Rd & Shelton Beach Rd.). It may be that the high sediment loads observed at the study site (Reading Creek) are controlled by larger scale factors in the surrounding watershed. Data was compiled and reviewed in the field and office. Field forms, datasheets and photographic databases were completed and reviewed each day. The qualitative and quantitative survey results are analyzed and summarize in this written written report.

## **BRIEF HISTORY AND BACKGROUND**

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History states that Prichard, AL was founded by Cleveland Prichard, a white developer and trader, however, research indicates that it is likely that many of the original inhabitants/settlers of what is now Prichard, Alabama were freed slaves that arrived on the *Clotilda*; the last documented slave trade ship to arrive in the United States (Encyclopedia of Alabama). The slaves aboard the *Clotide* were mostly of the Yoruba, Nupe, and Dendi tribes, each of which are West African tribes, often associated with present day Nigeria. The historical significance of the arrival of the *Clotilda* is the fact that it arrived on United States soil on July 8, 1860, 52 years after the abolishment of the international slave trade in 1808. All 110 African's on board were sold to into slavery, with the majority remaining in the Mobile area. Arriving just one year before the beginning of the American Civil War, many of the slaves were freed after the emancipation following the Union's triumph over the Confederacy in 1865. Having no place to go and wishing to return to Africa, many of the former slaves joined together and founded a small village in the Plateau/Magazine region of the Mobile Bay (just east of Prichard). The settlement they established would later be called Africa Town, the first town founded and continuously occupied and governed by African-Americans in the United States.

Although Prichard was settled prior to the arrival of the *Clotilda* and the subsequent settlement of Africa Town, Prichard did not see a steady rise in population until the Progressive Era of the 1890's-1920. Partially fueled by the rise in manufacturing, steel production, and ship building, in preparation for and in concurrence with World War I, population within the entire Mobile Bay area began a steady rise that would last until after the Second World War. For Prichard, this historic rise in population and growth for the community would last until the early Civil Rights movements of the 1960's (peak population 47,000+/-). Unfortunately the positive

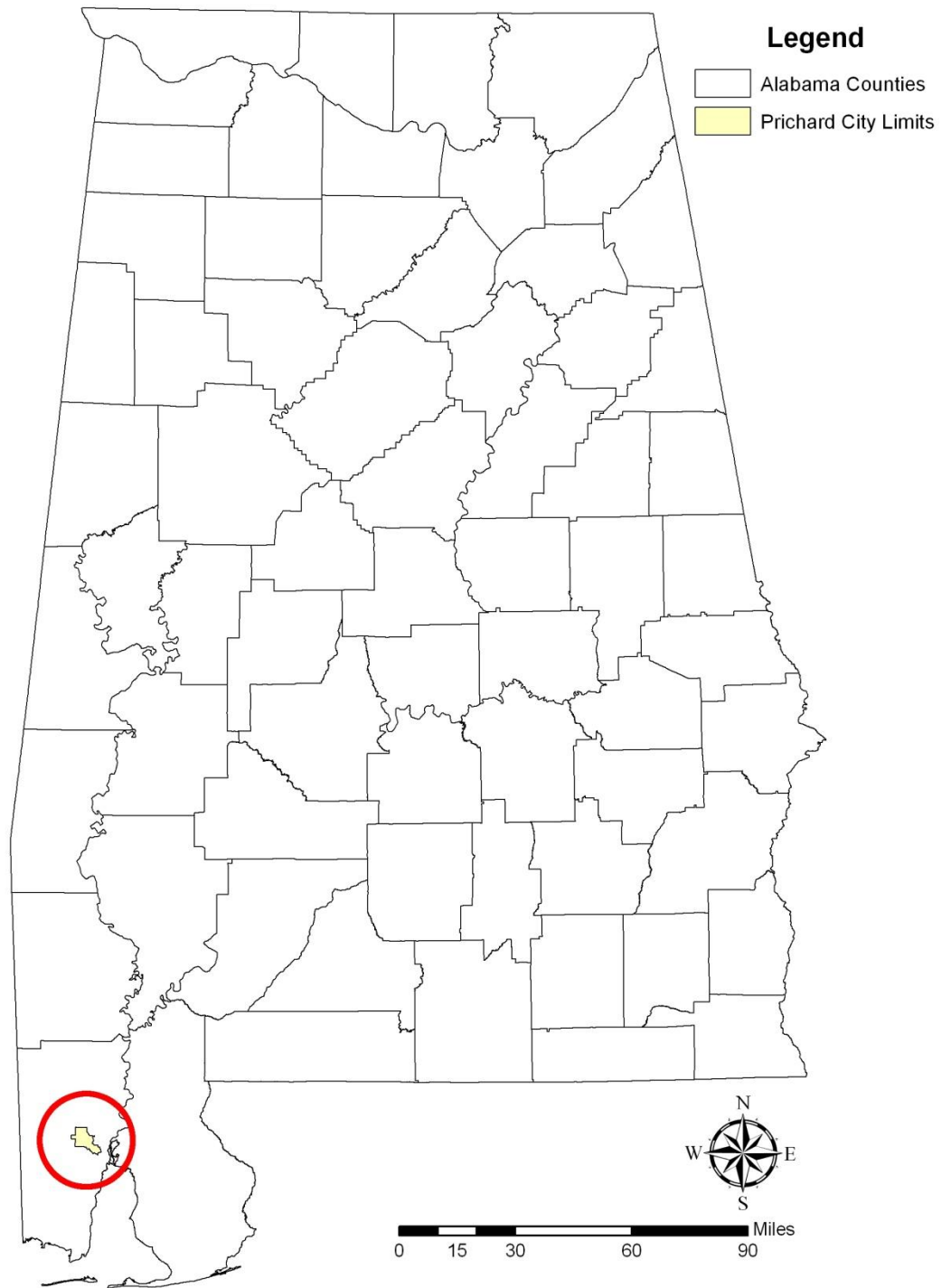
gains in Civil Rights made during these times would ultimately have negative demographic and economic impacts for the Prichard Community. Historic “whites only” areas of east Prichard were then being populated by blacks from the Bullshead, Neely, and Trinity Gardens communities of west Prichard. This shift in racial segregation resulted in one of the most pronounced examples of “white flight” of the 20<sup>th</sup> Century (City of Prichard Comprehensive Plan). See Appendix A—Census Data 2005-2007.

## **SITE CONTEXT**

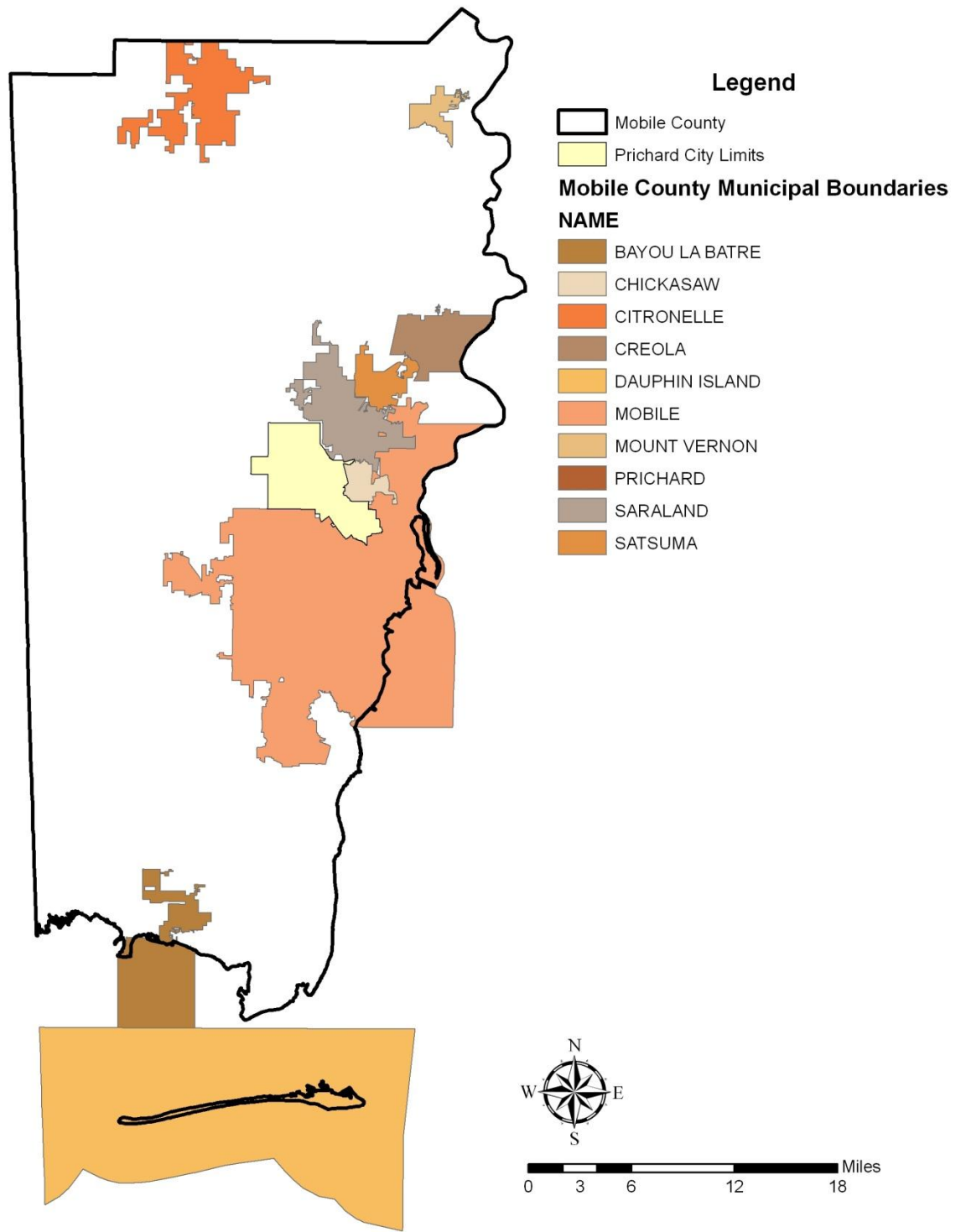
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### *Physical Location and Description*

Prichard, Alabama (hereafter Prichard) is located in east-central Mobile County, immediately northwest of Mobile, Alabama, immediately west of Chickasaw, Alabama, and immediately southwest of Saraland, Alabama (Figure 2). Additionally, although Prichard does not have any land that directly abuts the Mobile Bay, it is within 3 miles of the nearest open slough. With over 16,803 acres (26.25 square miles) of land within its incorporated limits, Prichard is the fourth largest municipal body in Mobile County (Figure 3). Prichard’s boundaries are irregular in shape, with the majority of the land mass being situated in the northwest half of the City (Figure 3). The linear distance between the furthest reaching eastern boundary and the furthest reaching western boundary is approximately 7.6 miles, while the linear distance between the furthest reaching northern boundary and the furthest reaching southern boundary is approximately 7.0 miles. The geographical circumference is approximately 30.8 miles, with the longest contiguous length measuring 3 miles (northern most boundary).



**Figure 2 – State Context and Physical Location**



**Figure 3 – Incorporated Municipal Boundaries of Mobile County**



## *Transportation*

The majority of the linear transportation and roadway infrastructure of Prichard is located within the downtown area, which makes up southeastern half of the City (Figure 4). The three largest routes of transportation for the City are US Highway 45 (US-45), Interstate 65 (I-65), and Interstate 165 (I-165). US-45 (also known as the southern terminus of US-43 of which portions are part of the historic Telegraph Road) transects Prichard from the northwest corner of the City and exits along the southern boundary. Prior to the construction of Interstate I-65, US-45 served as the principal connecting route between Mobile and Tuscaloosa, Birmingham, Muscle Shoals, and other north Alabama Cities and continuing into Tennessee. Following its completion in 1957 (and the Federal Aid-Highway Act of 1956), I-65 became the primary north-south roadway of Alabama, connecting Mobile (at Interstate 10) all the way to Gary, Indiana. The connection of I-65 to I-10 forms one of the major access routes of the eastern United States with the western states. Although I-10 and I-65 are successful major transportation routes for Mobile County, neither provide unobstructed high-speed access to the City of Mobile. Recognizing the necessity for quick and efficient access for Mobile to the suburbs in the northern half of the county, I-165 was constructed in 1994. This provided for approximately five miles interstate between Prichard and Mobile, which would also later serve to give a necessary boost to the struggling economy of Prichard. Prichard is able to distribute the majority of the incoming vehicular traffic onto its nearly 272 miles of arterial and connector streets.

Although vehicular transportation is the primary method of transportation in Prichard, there also exists freight and delivery access via rail on the Canadian National rail lines in southern Prichard (formerly part of the Mobile and Ohio Railroad system). These sections of railroad provide for freight transportation and access from Prichard to anywhere from New Orleans

Louisiana to northwest Canada. As with many railroad cities, these rail lines are also the likely reasoning for the strict grid-like structure of the stream layout that is exhibited in downtown Prichard (Figure 5).

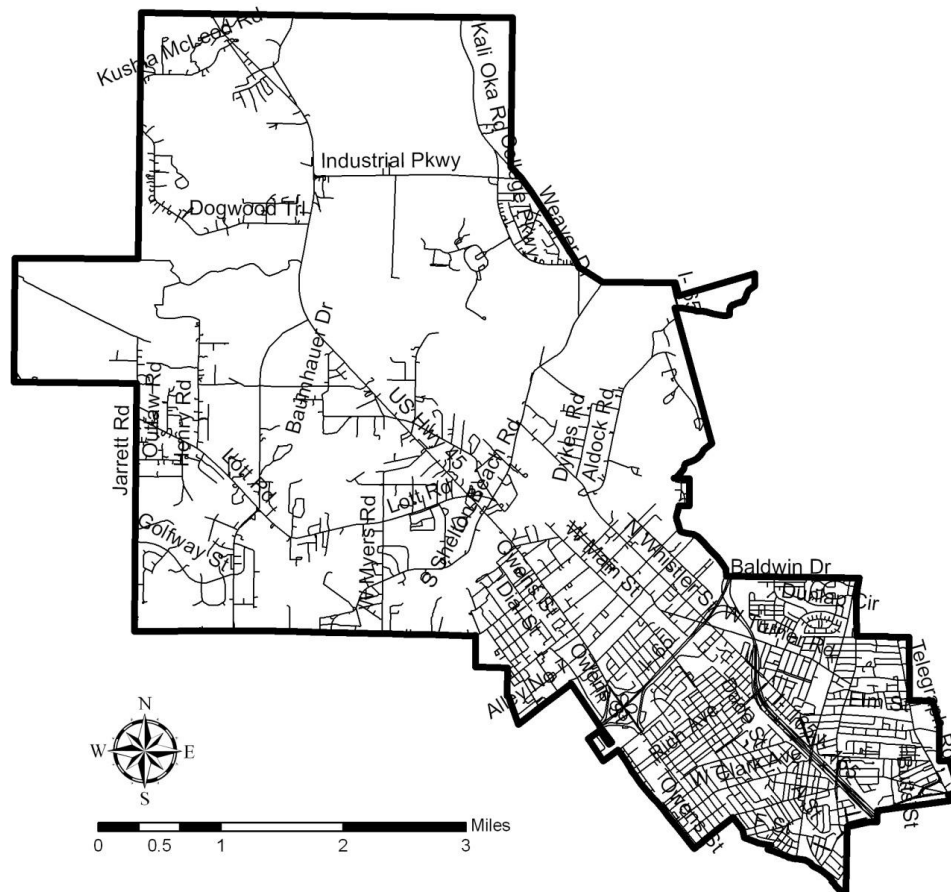


Figure 4 – Major and Minor Roads of Prichard Alabama

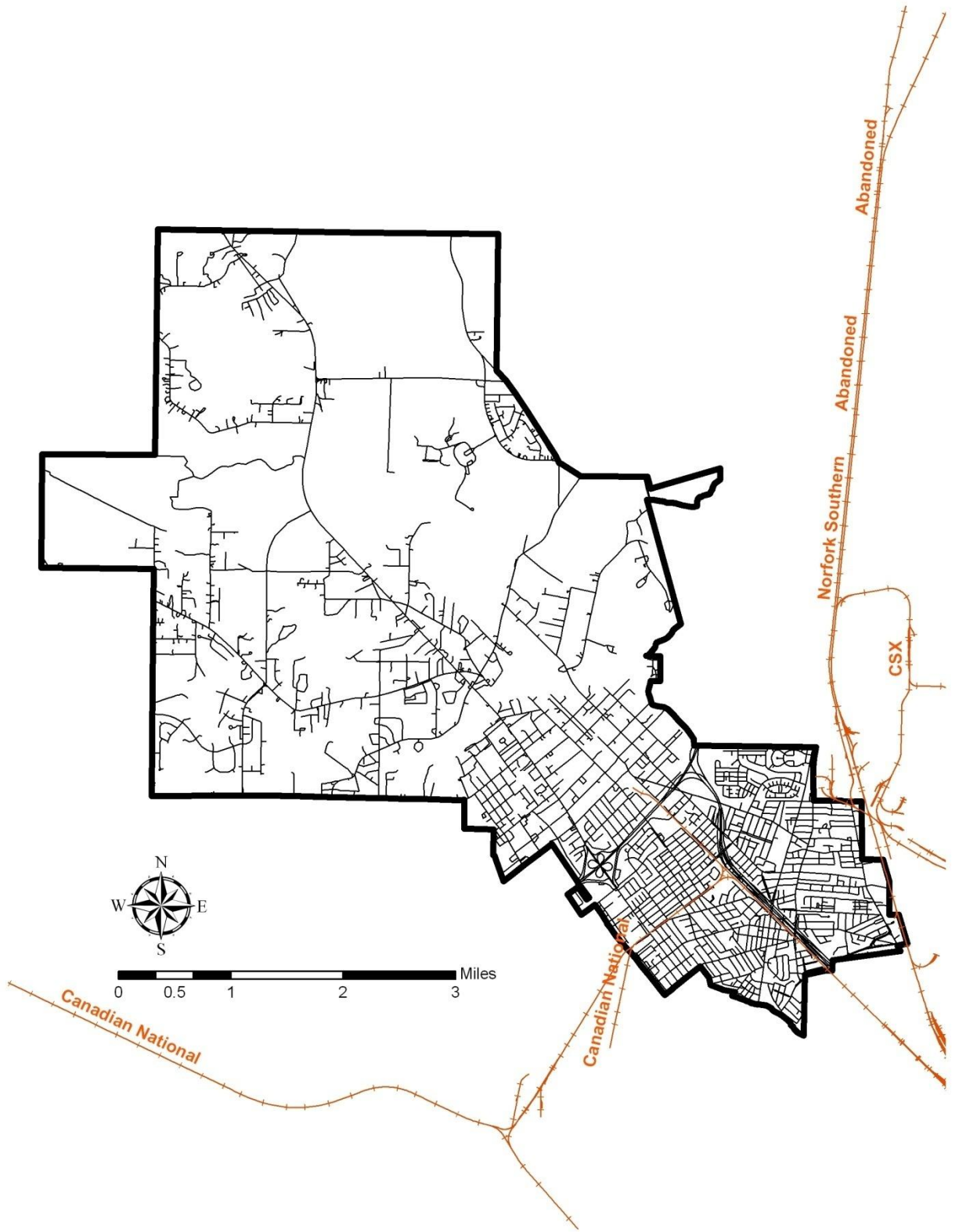


Figure 5 – Railroads of Prichard

## *Natural Resources and Landform*

### *Physiographic Region and Land Formation*

Prichard lies within a unique physiographic region of the southeast, in which different sections of the East Gulf Coastal Plain (Coastal Plain) come together at the mouth/delta of the Mobile River System (Figure 6). The Coastal Plain extends east-west all the way from the Florida panhandle region to Louisiana and north-south from its origin at the Gulf of Mexico to Tennessee and Kentucky. Having three distinct, yet overlapping geographic corridors of the Coastal Plain within its proximity (Alluvial, Alluvial-Deltaic, and Southern Pine Hills), Prichard likely exhibits characteristics of each within different areas of the City limits.

The formation of this region of the US and these geographic corridors can also be traced back to three distinct and overlapping geologic epochs in time. The northern and western portions of Prichard, which exhibit relatively higher elevations, can be traced back to the Miocene and Pleistocene epochs while formation of eastern Prichard dates back to the Holocene epoch. These periods in geologic time include the growing and shrinking of glacial formations across much of North America and the subsequent rise and fall of sea levels that once covered much of southern Alabama. Transitioning between Miocene and Pleistocene epochs and into the present geologic time of the Holocene saw additional fluctuations of sea levels, yet has maintained a fairly steady climate for the last 10,000 years.

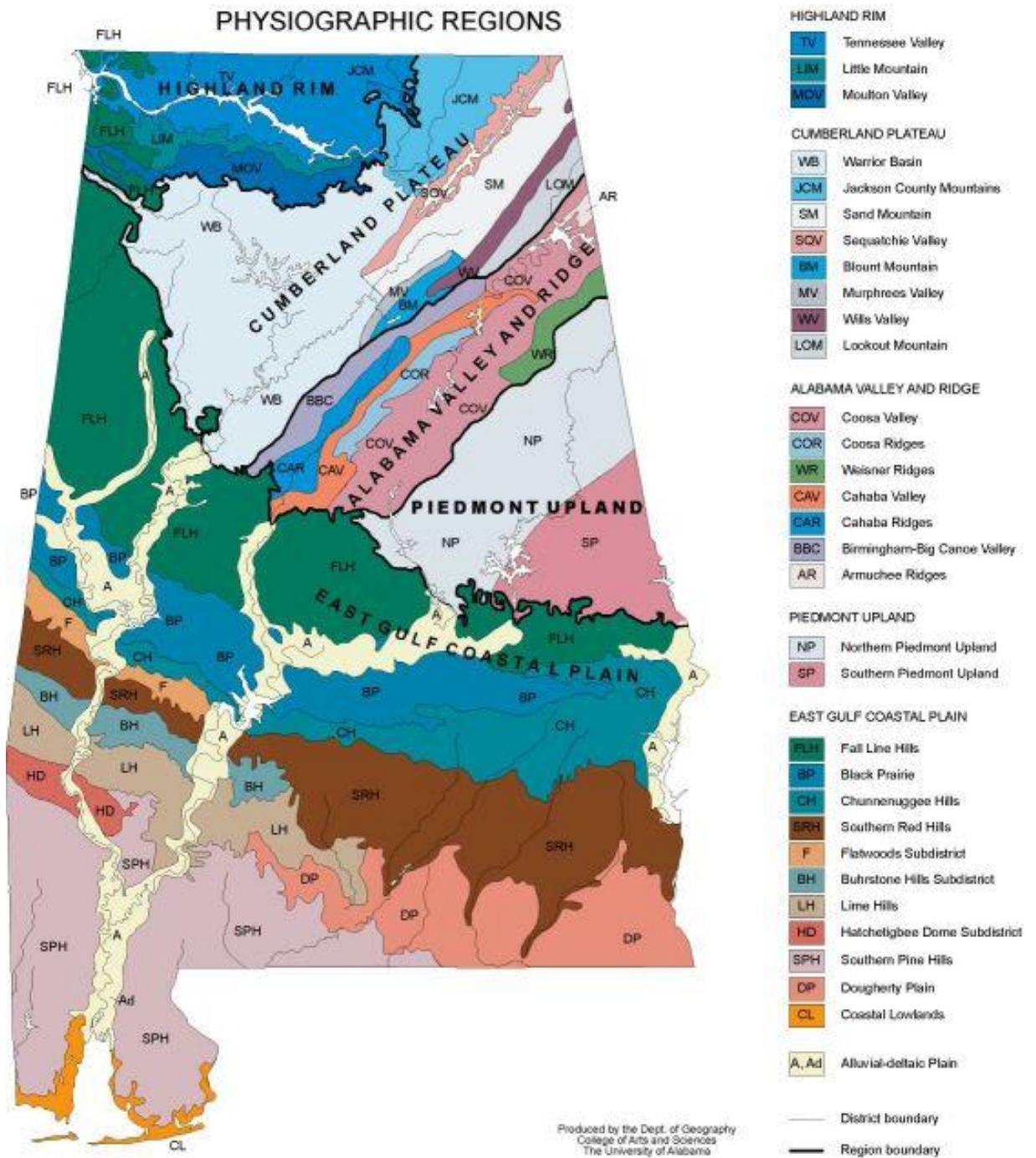


Figure 6 – Level IV Physiographic Regions of Alabama

## *Eco-region*

Each unique and distinguishable physiographic region also carries with it an equally unique ecological niche or zone known as an eco-region. Eco-regions are relatively large areas of the environment that are divided among their similarities in type, quality, and quantity of environmental resources. They are divided into four categories known as Eco-region Levels, with the Level I as the largest and broadest category and Level IV as the smallest and most well defined. Prichard is uniquely situated within the boundaries of three distinct Level IV eco-regions. In order from the smallest to the largest, Prichard lies within the *Southern Pine Plains and Hills*, *Gulf Coast Flatwoods*, and *Floodplains and Low Terraces* Level IV eco-regions of the *Southern Coastal Plains* and *Southeastern Plains* Level III eco-regions of the *Southeastern USA Plains* and *Mississippi Alluvial and Southeast USA Coastal Plains* Level II eco-regions of the *Eastern Temperate Forests* Level I eco-region (Figure 7). As each eco-region level is subsequently further stratified and more defined, each also exhibits characteristics of each of its larger categorical level of inclusion. For this reason it is best to describe the general characteristics and spatial arrangement of each of the Level IV eco-regions within the city limits of Prichard.

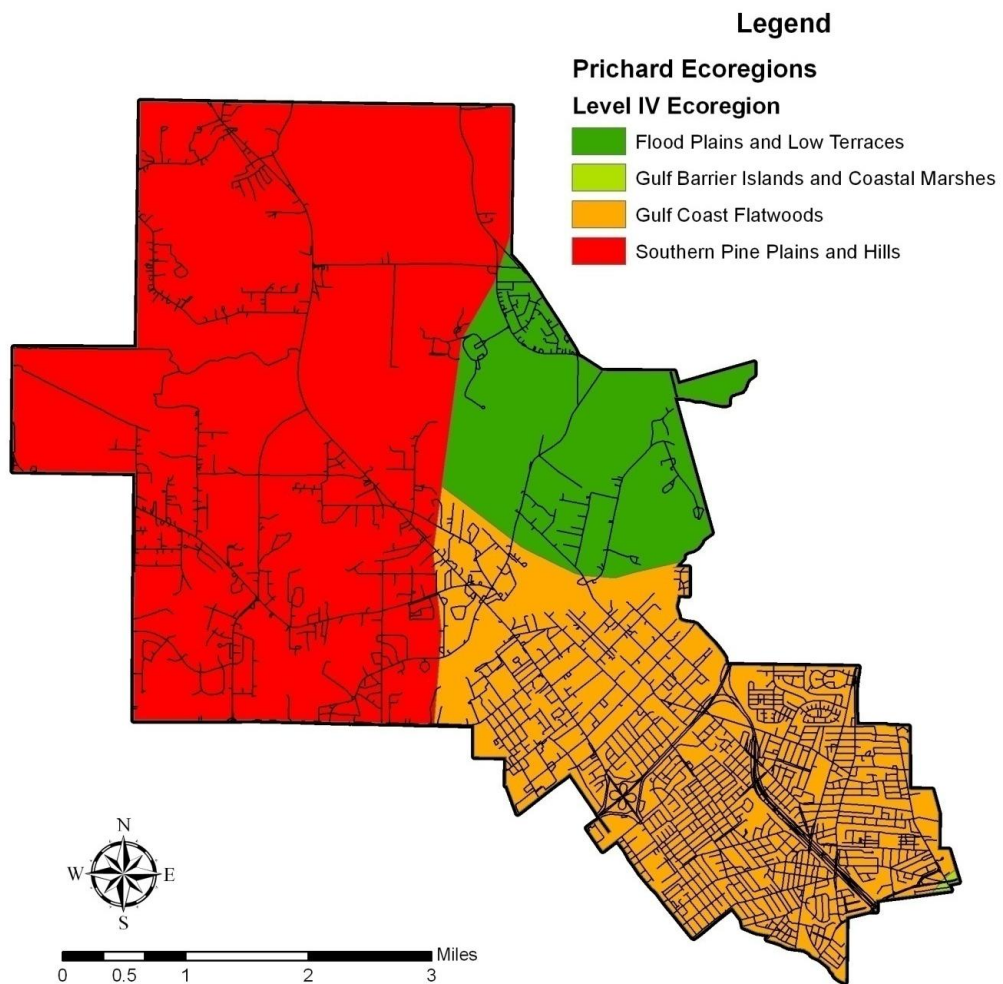
The *Southern Pine Plains and Hills* eco-region consists mostly of Southern mixed forests (Oak-Hickory-Pine) and longleaf pine forests. Scattered in and around the riparian corridors and wetlands are also the bottomland hardwood forests of Gums, Tupelos, and Cypress. Due to their unique composition of biotic and abiotic services, these forests covers, namely the longleaf pine, provide for specialized habitat for many endangered species. Animals such as the red cockaded woodpecker, eastern indigo snake, gopher tortoise, and Florida pine snake all can be found inhabiting the longleaf pine forests of this region. Unfortunately, much of the longleaf

pine forests have been heavily harvested in the past and the majority of harvested stands have been replaced with loblolly and slash pine. As is the vegetation in this eco-region, the hydrology is equally unique and rare. As the relief in elevation becomes ever more gradual and undulating to the south, the streams of the Southern Pine Plains and Hills become darker and are known as “black waters”. This coloration is formed by the increased presence of tannins which have leached out of the masses of organic matter within the streams. As with the longleaf pine forests, the black water streams and rivers are also home to several threatened and endangered species.

Equally distinguishable and important is the *Gulf Coastal Flatwoods* region and the flora and fauna that inhabit these areas. This is a narrow region of low lying terraces and deltaic deposits of Quaternary (geologic period between Pleistocene and Holocene) sands and clays along the southern most boundaries of the Alabama Gulf Coast. Heavily forested, with over 90% coverage in the region, there are numerous depressions and sandy flats that form marshes and tidal wetlands within this region. Also, as with the *Southern Pine Plains and Hills* eco-region, the *Gulf Coastal Flatwoods* areas are dominated by loblolly and slash pine stands, mostly of which are also replacements of former longleaf pine stands. Other common plants species in this region include the chalky bluestem, Indian grass, saw palmetto, sabal palmetto, and numerous panicum grass species. Some of the threatened and endangered species that inhabit this region are the flatwoods salamander, American woodcock, southern shrew, diamondback rattlesnake, and many others.

Similar to the *Gulf Coastal Flatwoods* region but generally of lesser elevation and relief is the Floodplains and Low Terraces region. This eco-region generally consists of those areas abutting or adjacent to the slow moving and sluggish river systems of the coastal plains. Common to these riparian corridors are the tupelo, cypress, and oak dominated bottomland

wetlands. As the name suggests, many areas of this region are frequently flooded, resulting in a soil composition of mostly alluvial deposits of clay, sand, and silt. Surrounding wetlands also contribute to a heavy organic mixture and often form an upper layer of muck within the top soil horizon. As with the *Southern Pine Plains and Hills* eco-region, black water streams and rivers are also common to this ecological area.



**Figure 7 – Level IV Eco-regions of Prichard**



## *Hydrology*

As noted above, Prichard lies within the coastal plains region of Alabama. The hydrology of the gulf coastal plains areas is distinguishable in that it marks the transitional zone between the higher elevations of the Appalachian and the Piedmont regions and the Gulf of Mexico. At the extreme southern edge of the coastal plains and abutting the Mobile Bay delta region, elevation relief and hydrologic slope is minimal, resulting in slow moving stream and river systems. All river and stream systems in the United States, including the slower moving large rivers of the coastal plains, are divided into Hydrologic Unit Codes, of similar fashion to differentiation of physiographic systems into eco-regions.

Prichard is located in the Mobile River Basin (also known as the Mobile-Tensaw Basin), of which drains more than 44,000 square miles of land from Georgia, Tennessee, Alabama, and Mississippi and is the fourth largest river basin the United States (Figure 8). The larger Mobile River basin is formed after the confluence of the Alabama River basin with the Mobile-Tombigbee River basin. Each of these basins is subsequently divided into smaller and smaller sub-basins and watersheds, of which there are five that transect the city limits of Prichard. These five smaller hydrologic unit boundaries (HUC-12's) consist of the Bayou Sara (HUC 12 – 031602040302), *Eight Mile Creek (HUC 12 – 031602040403)*, Lower Chasaw Creek (HUC 12 – 031602040404), Seabury Creek (HUC 12 – 031602040402), and Three Mile Creek (HUC 12 – 031602040504) watersheds (Figure 9). The most prevalent and widest ranging of these within the city limits of Prichard is that of the Seabury Creek Watershed (6,037 acres within Prichard limits), followed closely behind by the Eight Mile Creek Watershed (5,236 acres within Prichard limits).

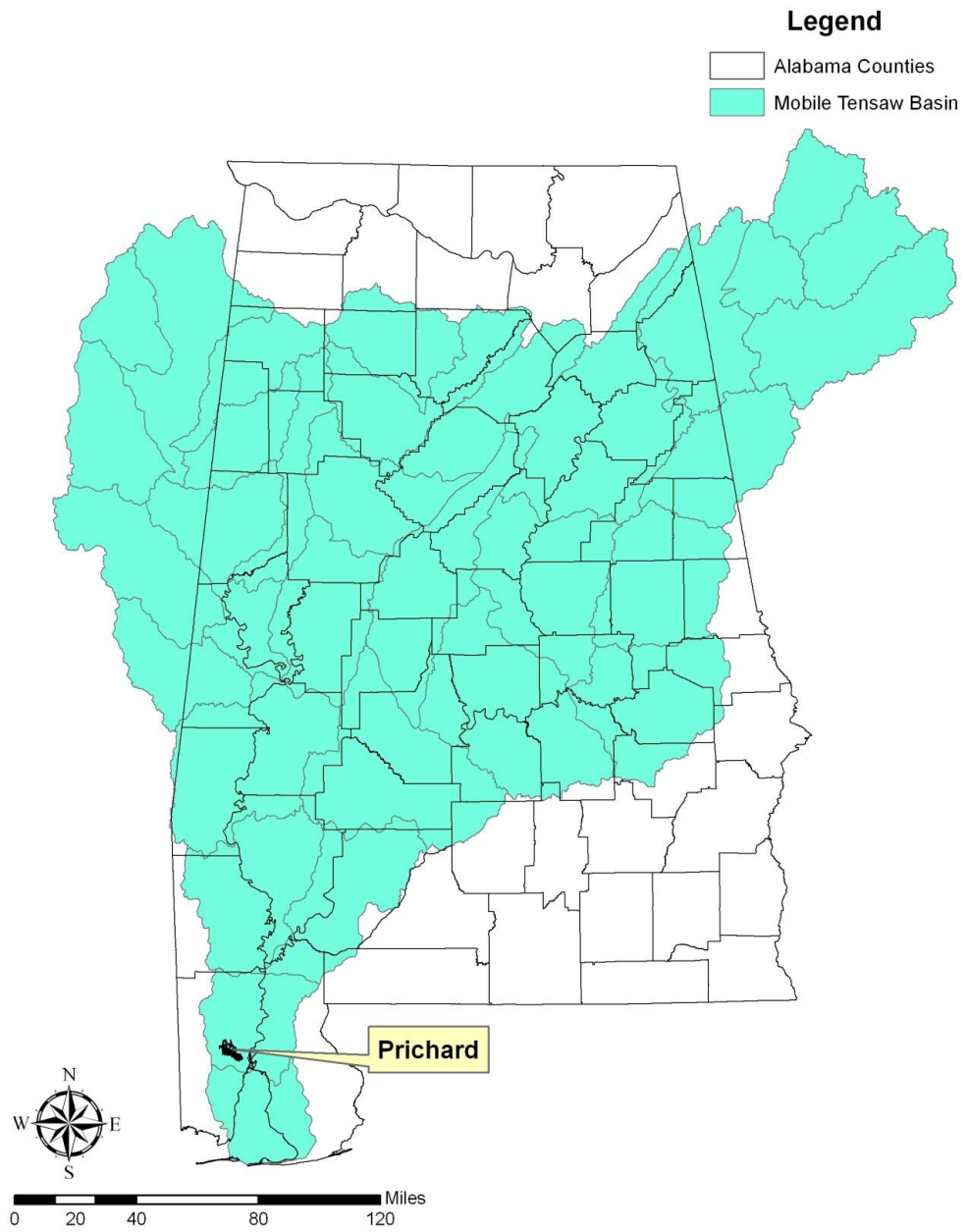
There are numerous smaller tributaries, ponds, lakes, sloughs, wetlands, marshes, etc. that make up the hydrologic network within each of these basins and watersheds. Some of the

larger named streams within Prichard are the Chickasabogue Creek, Toulmin Spring Branch, Magee Creek, Ellis Branch, Gurnanus Branch, and Dean Branch (Figure 10). Although these may be smaller in size than the larger creeks and rivers that they feed into, smaller tributaries like these usually make up more than 70% of a watershed's hydrologic stream network and are often host to a multitude of wildlife and habitats. These systems are also often the primary source of surface water to adjacent freshwater wetlands systems and floodplains that are dependent upon seasonal and infrequent flows for normal function. These wetland and floodplain systems are often referred to as the "kidneys and liver" of watersheds due to their unique abilities such as the storage of large quantities of water during flood events, moderation of peak flows, maintenance of water quality, groundwater recharge, and prevention of channel and bank erosion.

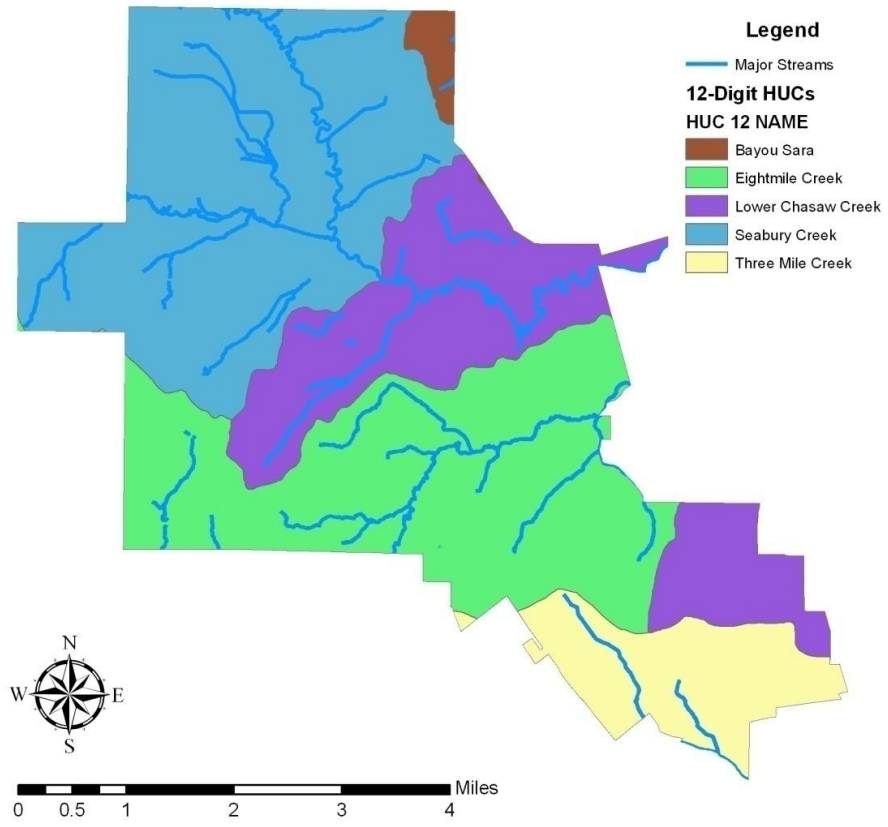
Within Prichard there are more than 3,160 acres of freshwater wetlands and more than 3,714 acres of floodplain (Figure 11 and Figure 12). With a total of 16,803 acres of land within the city limits of Prichard, wetlands make up approximately 18% and floodplains comprise of approximately 22% (for a total of 40%). The majority of the floodplain and wetlands within the Prichard city limits are in the Seabury Creek Watershed, with the smallest amount being located in urban areas of southeast Prichard and in the Lower Chasaw and Three Mile Creek watersheds. Although they cover a seemingly large geographic area of Prichard and they have the ability to alleviate both water quantity and quality concerns within the watershed, there are two major streams that service these systems that are on the State of Alabama 303(d) list of impaired waters.

There are 303(d) listed waters within Prichard and the sub-watershed. 303(d) listed waters are bodies of water that do not exhibit or attain water quality standards per the assigned designated use. There are currently (ADEM, 2008 303(d) List) two streams that flow through

Prichard that are on the Alabama Department of Environmental Management (ADEM) list of impaired waters for the State of Alabama. These streams are the Chickasaw Creek and Toulmins Spring Branch (Figure 13). Chickasaw Creek has a designated use for swimming and fish and wildlife, while Toulmins Spring Branch has a designated use for fish and wildlife. The designation of uses for these streams requires that State minimum water quality standards are met for various parameters and pollutants. As listed, the cause(s) of impairment for Chickasaw Creek is Mercury and the cause(s) of impairment of Toulmins Spring Branch are ammonia, nutrients, and pathogens. As a requirement of the State by the Environmental Protection Agency (EPA), each of the listed impaired waterbodies shall have developed a Total Maximum Daily Load (TMDL). These TMDL's are the establishment of the maximum amount of a designated pollutant that may enter a given water body. As of the 2008 303(d) listing, there are currently not TMDL's developed for Chickasaw Creek or Toulmins Spring Branch. However, ADEM has proposed that a draft TMDL being formed for Toulmins Spring Branch by 2008 and for Chickasaw Creek by 2013.



**Figure 8 – Mobile River Basin**



**Figure 9 – HUC 12 Watersheds of Prichard**

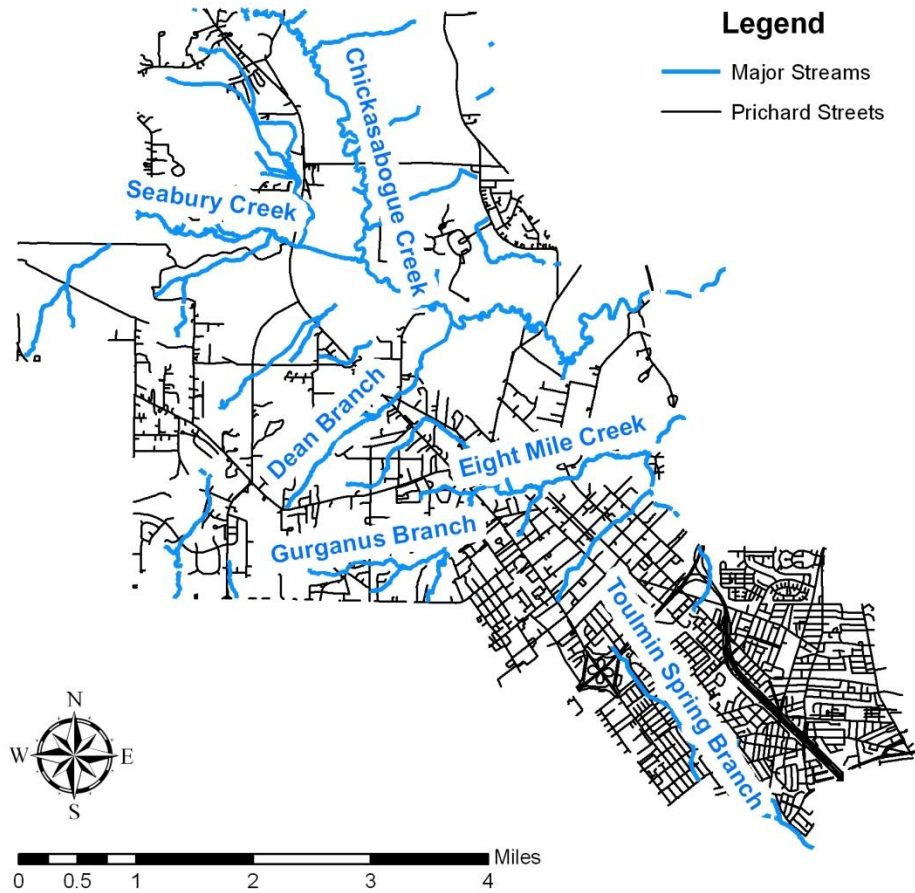
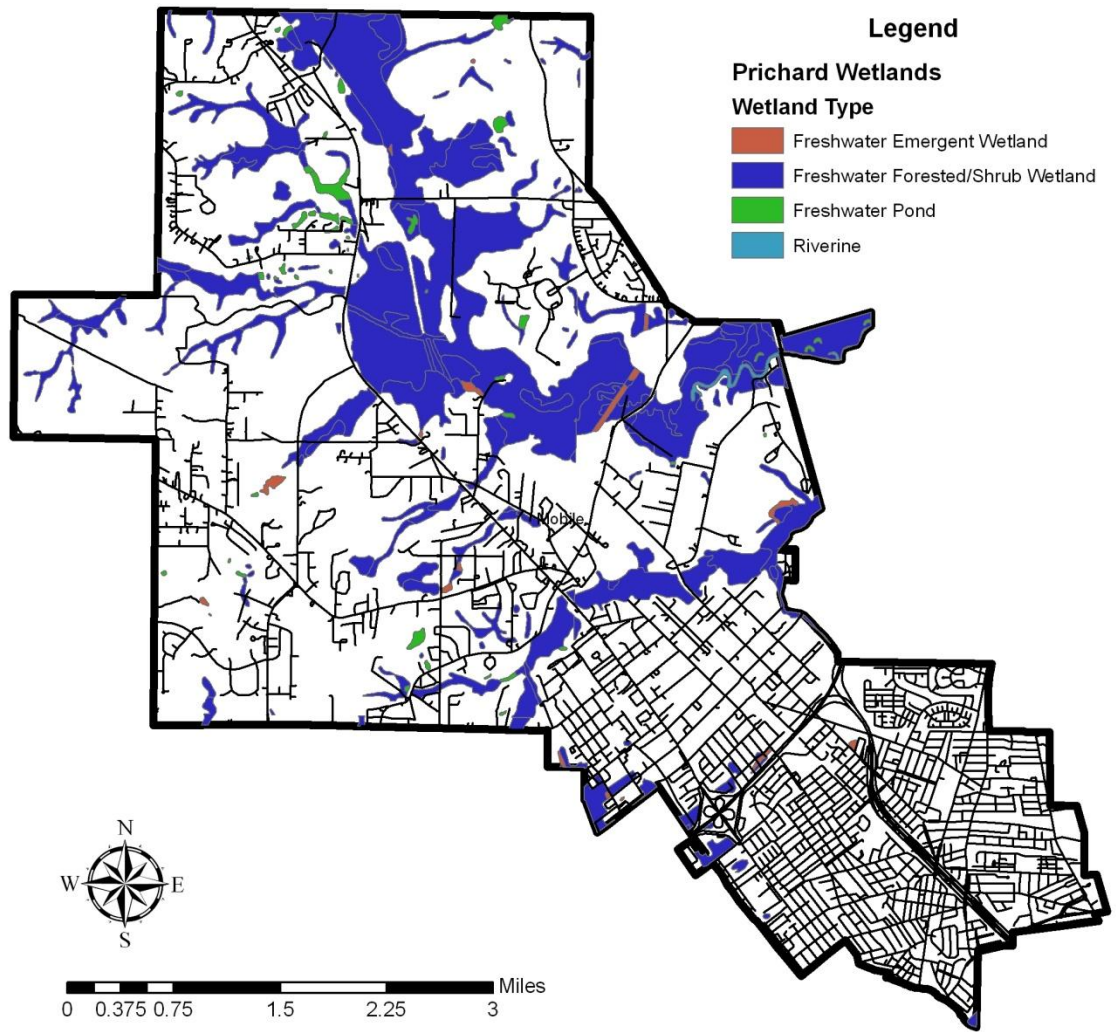
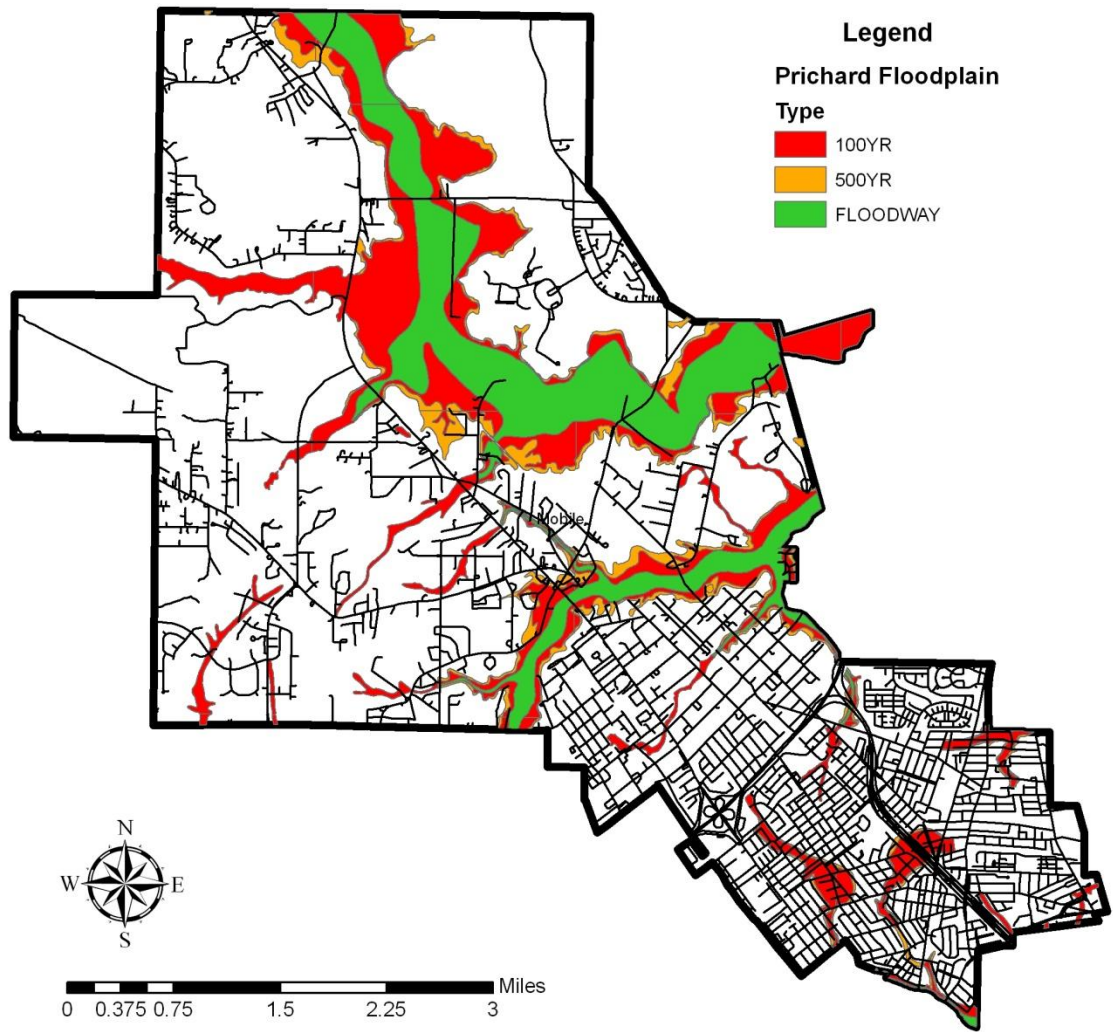


Figure 10 – Major Hydrologic Features of Prichard

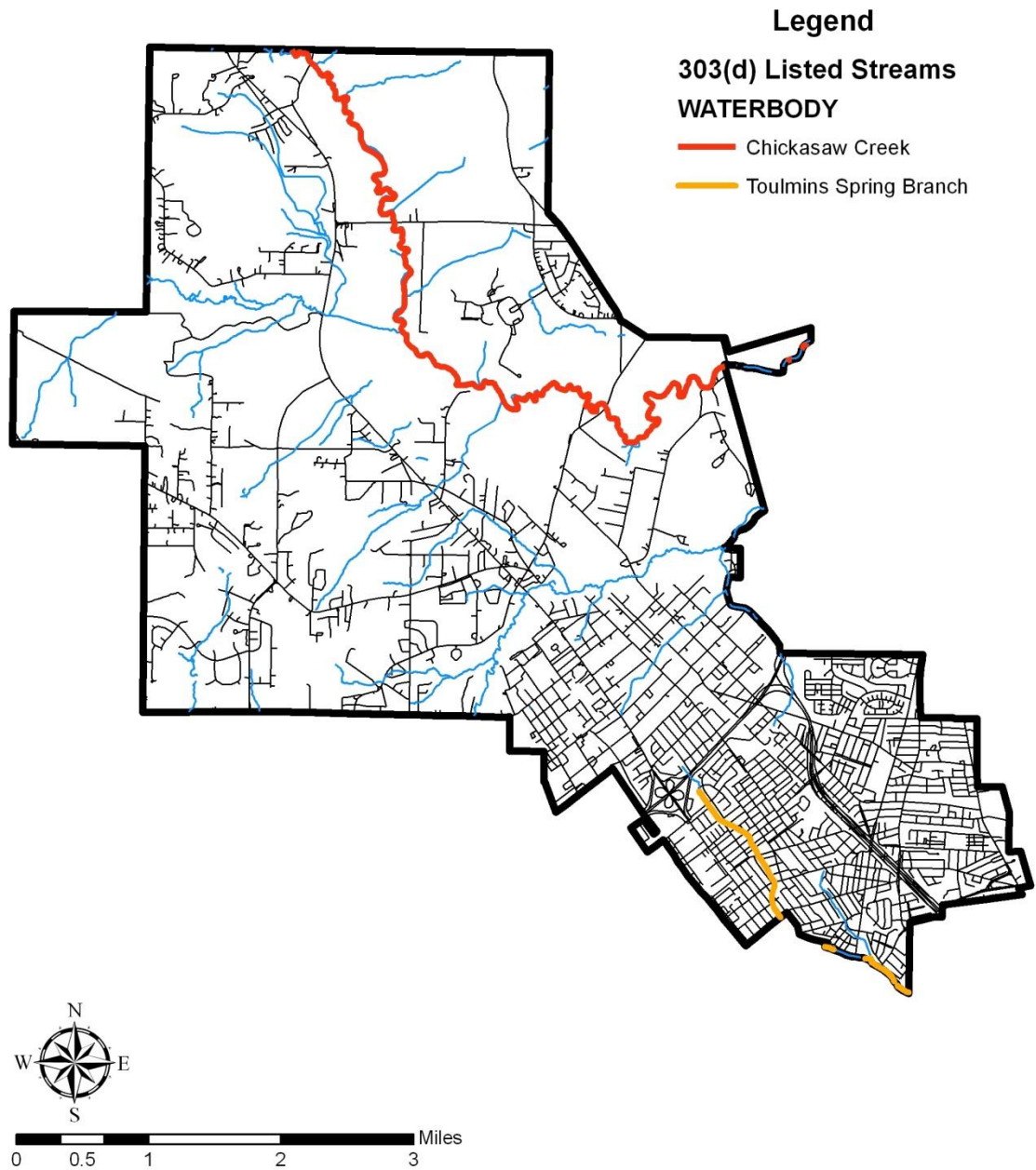


**Figure 11 – Freshwater Wetlands of Prichard**



**Figure 12 – 100-Year and 500-Year Floodplains of Prichard**





**Figure 13 – 303(d) Listed Streams of Prichard**

## *Topography*

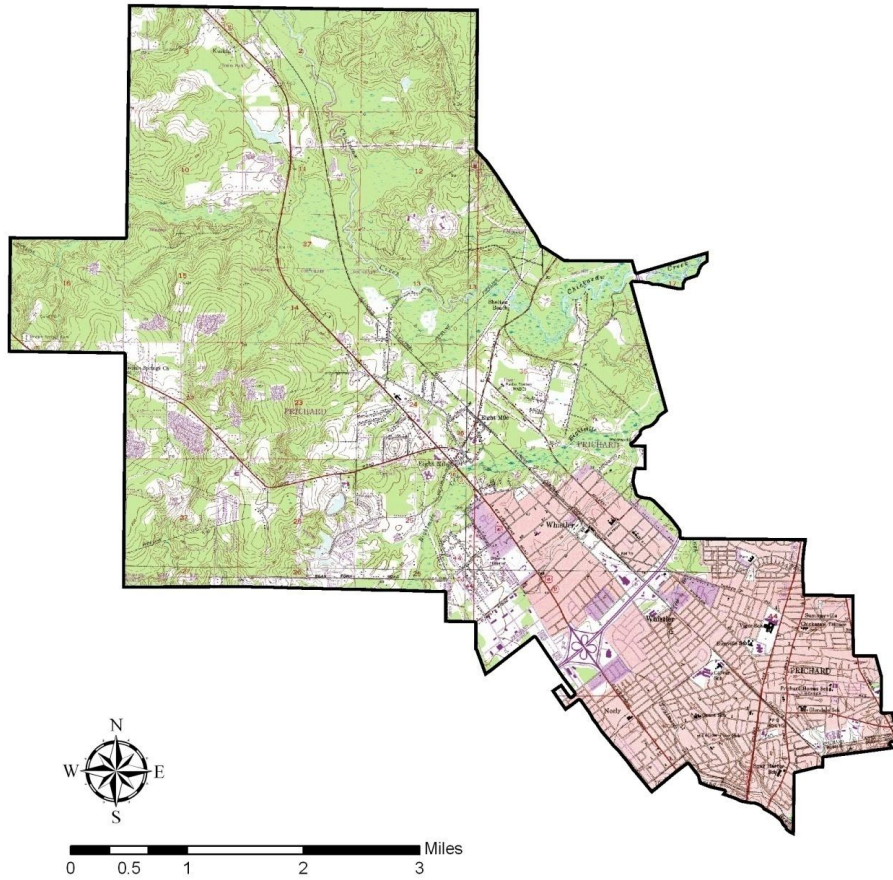
With a low elevation of near Mean Sea Level (MSL) along the eastern regions of Prichard and a high point of nearly 220 feet above MSL to the west, there is moderate topographic change across the City of Prichard (Figure 14). With few exceptions of increased slope to the west, average slope in Prichard generally ranges from 1-15%, with the majority between 2-8% (Figure 17). These subtle, yet occasionally strong, topographic changes are common to the coastal plains area. The gradually decreasing elevation that is exhibited from west to east across Prichard is indicative of the general surface flows toward the Mobile Bay and Delta (Figure 15 and Figure 16).

## *Green Space*

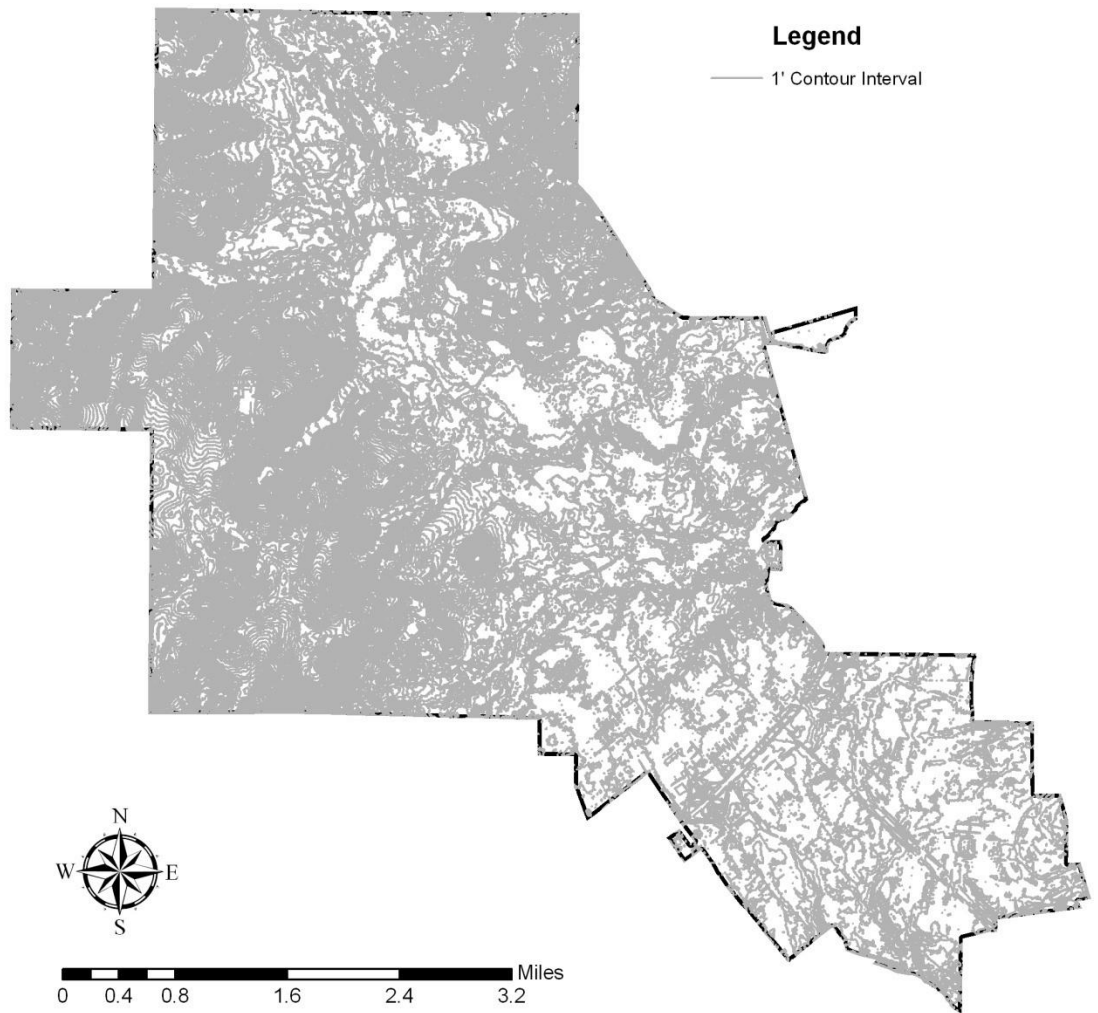
The analysis of green space for the lower 8-Mile Creek watershed is derived from 2006 orthographic imagery. The collection of the “green space” polygons within this study was gathered from decisions based on vegetation density. Observations from the data collection show the fragmenting of green space as the density of development increases especially along major roads and within the city of Prichard. Another observation is that although impairments upon the regions watersheds and streams are high there is much less disturbance and a higher percentage of green space along streams with greater water volume. The connection of Reading Creek in Reading Park to a larger green infrastructure and a larger system of ecological networks is achieved through many such tributaries feeding into 8 Mile Creek. The possible implementation of Reading Creek stream remediation (within Reading Park) will contribute to the health and ecological functionality within the lower 8-Mile Creek watershed and help it to ease impairments of its 303d classification.

In Prichard, Al there are only five areas designated as public park space. They include: Highpoint Park, Fagerstrom Park, Pollard Park, Infra-Care Center, and Prichard Municipal Stadium. Of these parks only one is targeted at young children while the others have the main function of being used for sporting events and recreation of that sort. While there is nothing wrong with having recreational parks such as these it might be to the benefit of the city to designate an area within one or multiple of these parks to create examples of native habitat. The restoration of Reading Creek in Reading Park will facilitate this. The restoration of Reading Creek will also provide environmental education opportunities and increase native biodiversity within the lower 8-Mile Creek watershed area.

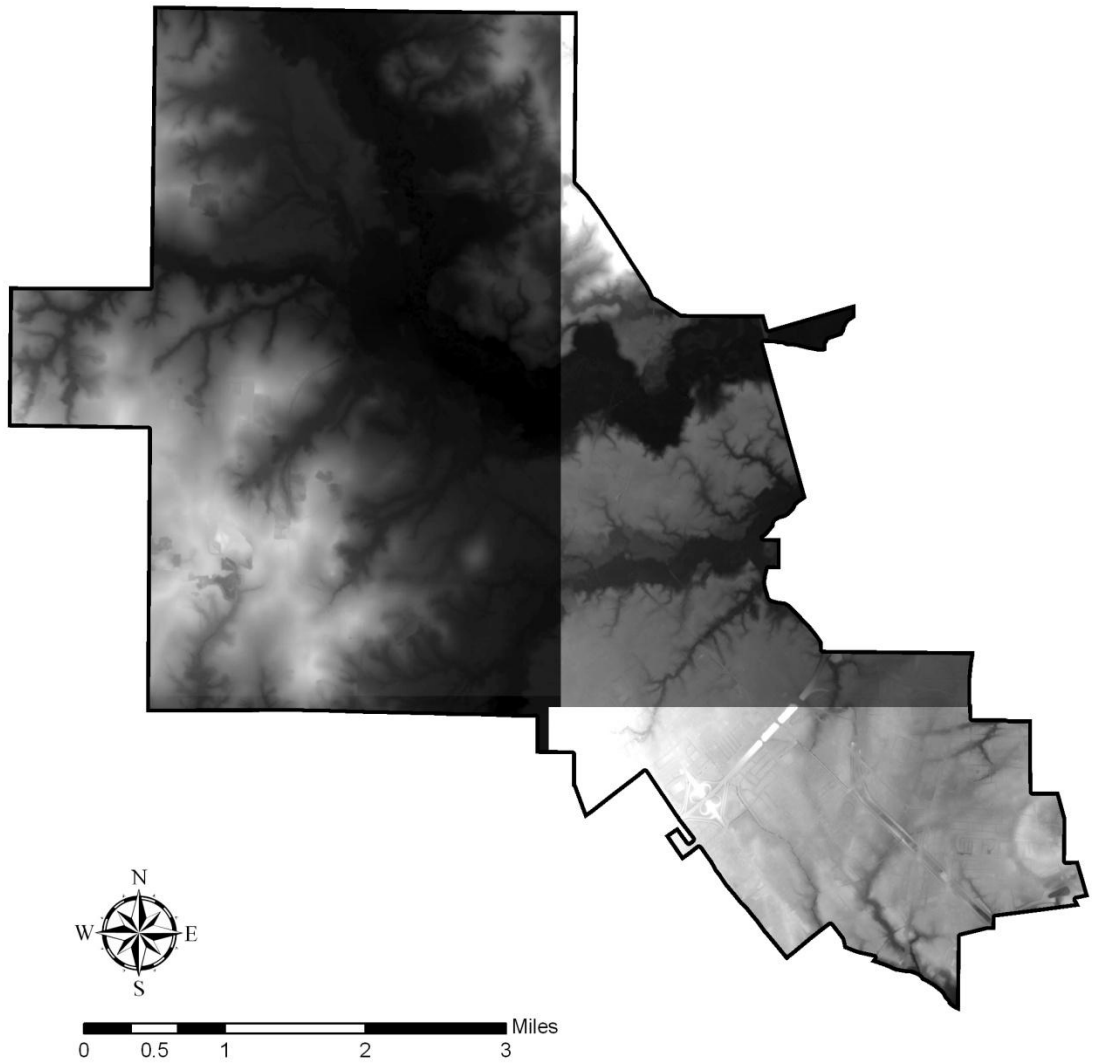
It is worth noting that the 2006 City of Prichard Comprehensive Plan (MACTEC Engineering, Inc.) mentioned that the National Recreation and Parks Association recommended a range from 6.25 to 10.5 acres of land for recreation for every 1,000 residents. Their study reports that if Chickasabogue Park is omitted from city maintained park areas then between 127 and 255 acres of additional park and recreation area is needed. Mobile County maintains Chickasabogue Park which is located in the Prichard city limits (MACTEC, p. 2-42). Chickasabogue Park serves the citizens of Mobile County and is 1,050 acres. See Appendix C--Green Space Analysis of Reading Creek subwatershed and Appendix D --Green Space Analysis\_Board.



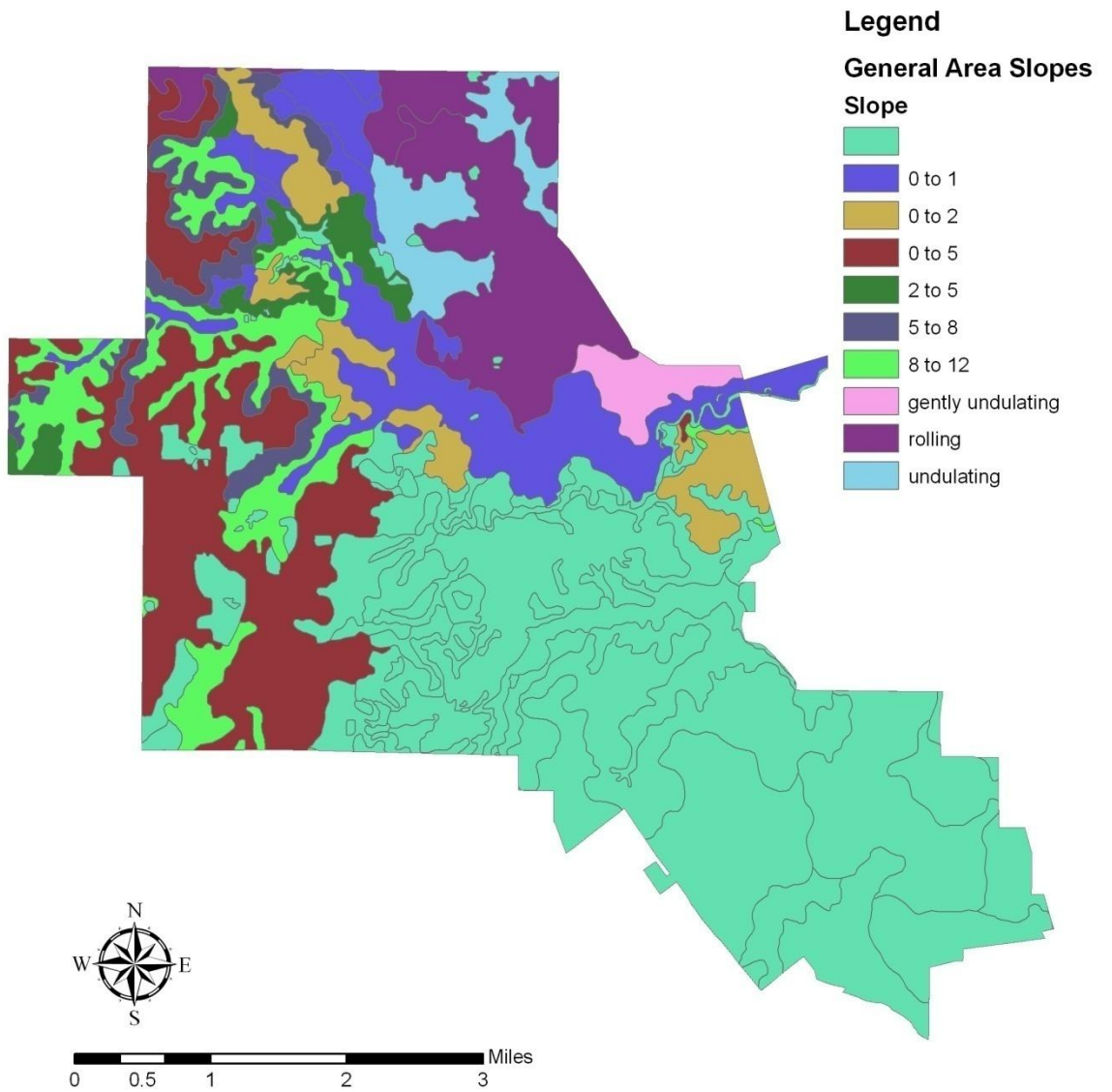
**Figure 14 – USGS 7.5 Minute Topographic Map of Prichard**



**Figure 15 – 1' Contour Map of Prichard**



**Figure 16 – Digital Elevation Map of Prichard**



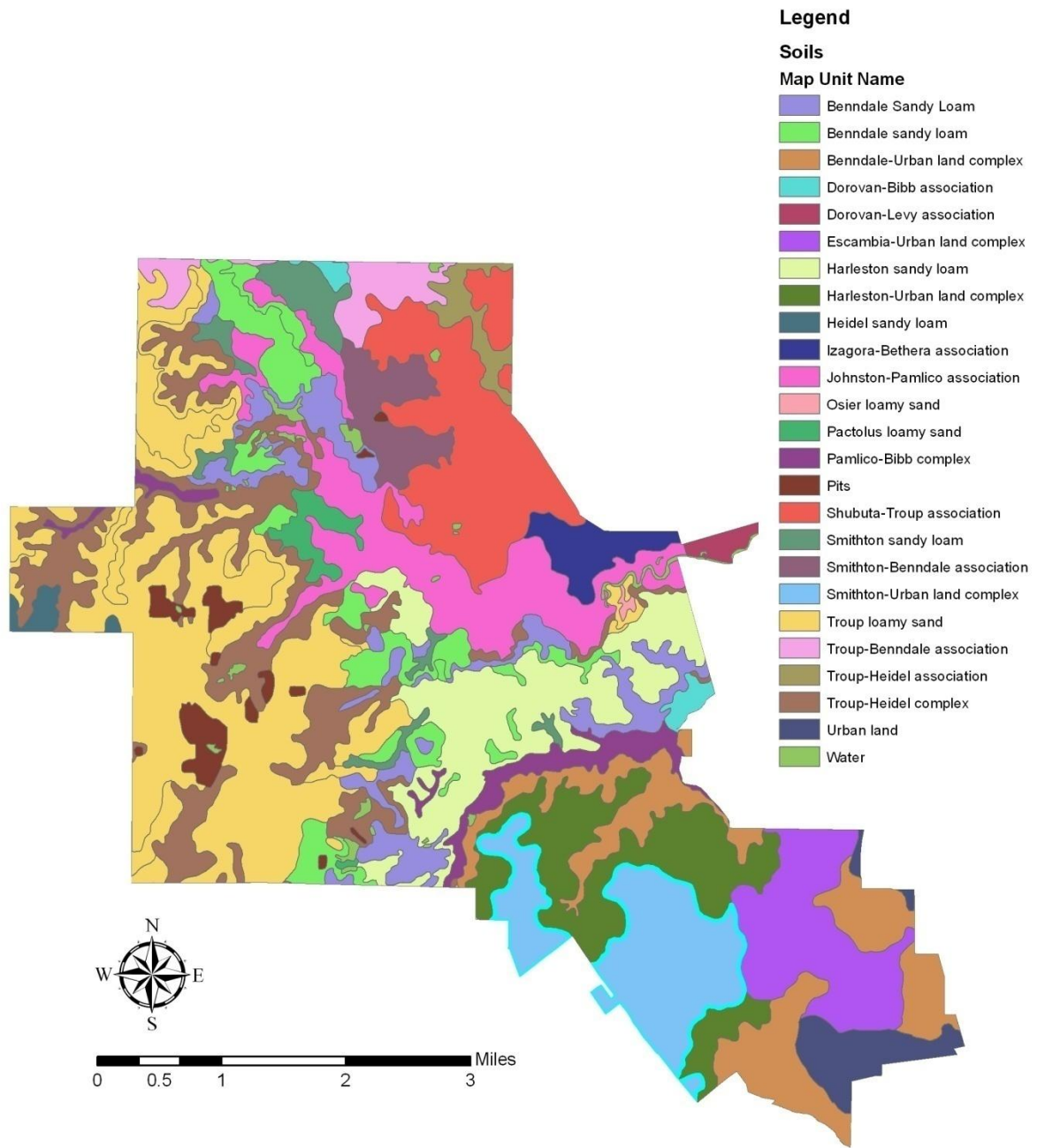
**Figure 17 – General Slopes of Prichard**

## *Soils*

Soils are general categorized into one of 12 Orders, which are subsequently broken down into Sub-Orders, Great Groups, Sub-Groups, Families, Series, and Unit Names. There are over 25 different soil types of the Map Unit Name found within Prichard, Alabama (Figure 18).

Generally, the majority soil type is loamy sand that is typically composed of 80% sand, 15% silt, and 5% clay. Again, this soil type is common to the coastal plains region and is not specific to Prichard. Of the 25 different soil types, the most commonly found is that of the *Troup Loamy Sand* Map Unit Name. These soils generally exhibit a deep and somewhat excessively drained layering with a thick sandy surface and subsurface layers with loamy sublayers. Their formation is from a parent material of unconsolidated sandy and loamy marine sediments on Coastal Plain upland areas. Slopes of this soils series in and around Prichard are typically 0-5% and gently undulating. Although the majority natural vegetative cover type is of pine and hardwood forest within this soil type, it has been found to be of good agricultural use for growing peanuts, watermelons, vegetables, and other pasture grasses.

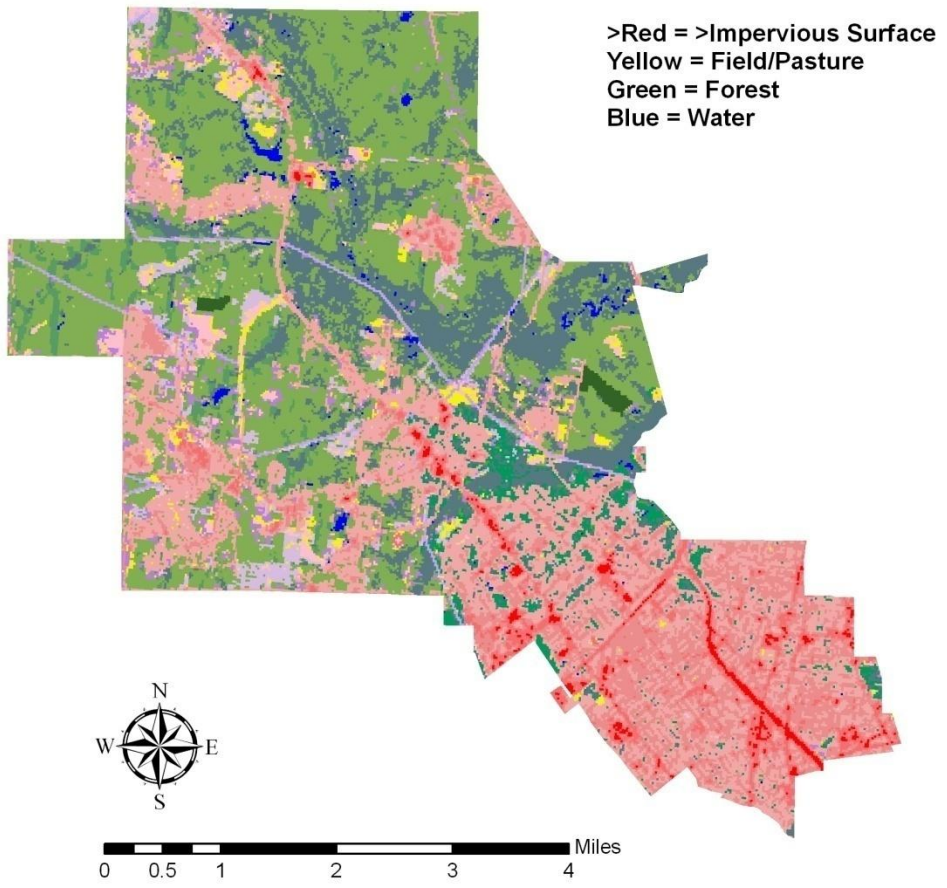




**Figure 18 – Soils of Prichard**

## *Land Cover*

Evaluation of the 2007 National Land Cover Data (NLCD) coverage for Prichard indicates that Prichard is approximately 50% urban/suburban residential and 50% forested/pasture, water, and/or otherwise open space (Figure 19). The majority of medium to high intensity developed areas occur, for the most part, within the historic southeast region of Prichard. These areas of development are the areas in which the highest impervious surface ratios are likely to occur and the areas that are most likely to be experiencing the highest degree of environmental impact. As within many cities that saw phenomenal growth in the earlier parts of the 20<sup>th</sup> Century, these areas of Prichard were likely developed without regard to environmentally sensitive areas. With the majority of the rise in population and development of Prichard occurring prior to modern environmental regulatory policies and acts (ex. Clean Water Act), it is also likely that these areas experienced and are continuing to experience a steady decline of environmental quality within these high density areas. Testament to this assumption is the listing of Toulmins Spring Branch on the States 303(d) list of impaired waters. Toulmins Spring Branch is located in an area that is indicated on the land cover maps as being high intensity development and is listed on the 303(d) list for ammonia, pathogens, and nutrients. These pollutants are often associated with urban environments, more particularly with sanitary sewer overflows of which increase in number and magnitude with older systems and areas of higher population density.



**Figure 19 – General Land Cover of Prichard**

## *Biodiversity*

In the APPENDIX, you will list that provide local species of flora and fauna that can currently be found in and around the lower 8-Mile Creek watershed of Prichard, Alabama. These lists provide a guide for information when restoring, creating, or protecting native environments in the area. The recourses used to gathered and compile these lists were retrieved from multiple online recourses such as Alabama Gap and The Alabama Natural Heritage Program. Attribute Tables of species were clipped to the lower 8-Mile Creek watershed boundary. See Appendix E--Flora & Fauna\_Lower 8-Mile Creek Watershed.

## **RECOMMENDATIONS**

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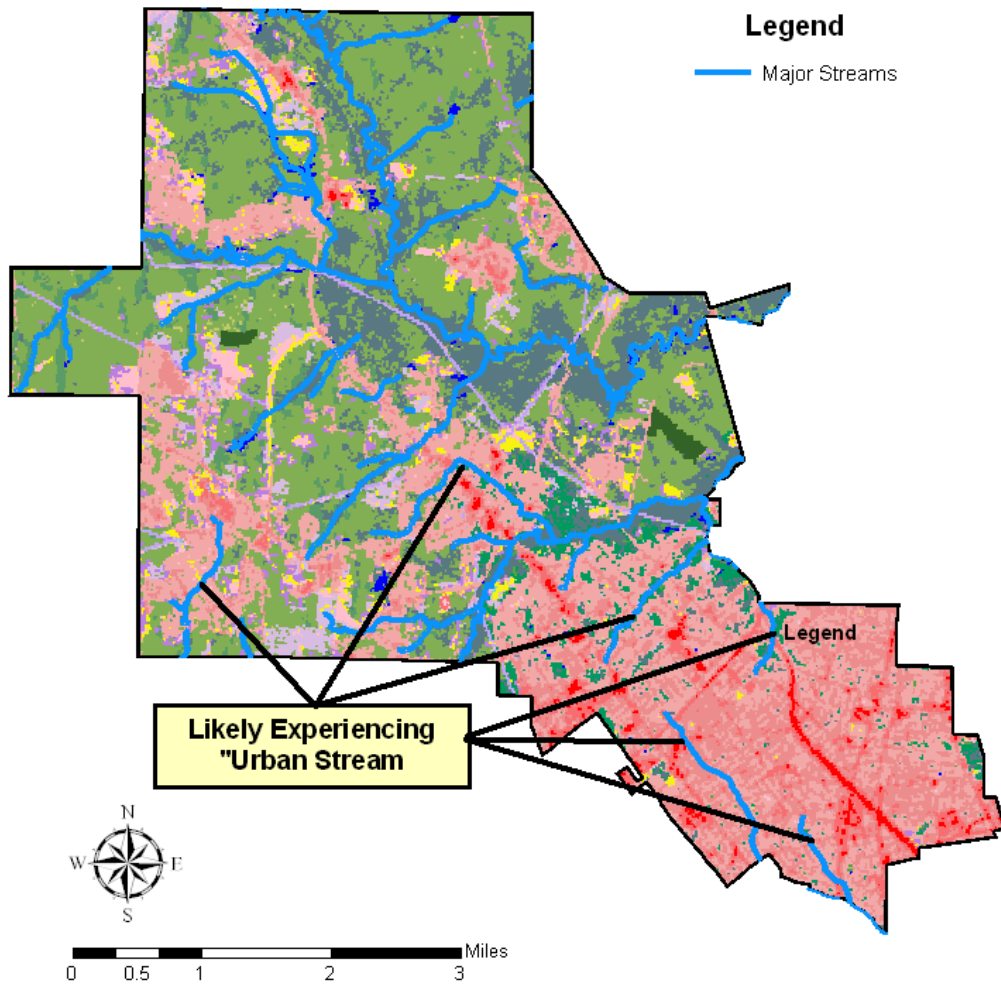
As an example of this method of choice for prioritization, a focused approach is presented to develop several options for the management, preservation, and potential restoration of various water resources. Prichard, as already mentioned, experienced exponential growth and development in the early 20<sup>th</sup> century, prior to the adoption of modern day water resource regulations and the passage of the Clean Water Act. Like many other cities, without this method of regulation and enforcement of standards and protection for streams, wetlands, tidal marshes, and other aquatic habitats both direct and indirect impacts to these environments were exaggerated and rampant during these times. It would not be correct however, to say that the majority of these impacts were done maliciously, but the knowledge of the potential consequences of unchecked development was simply not available during these times.

The good news is that in today's society we do have a better understanding what effect our actions have on the surrounding environment. We know that increased impervious surface

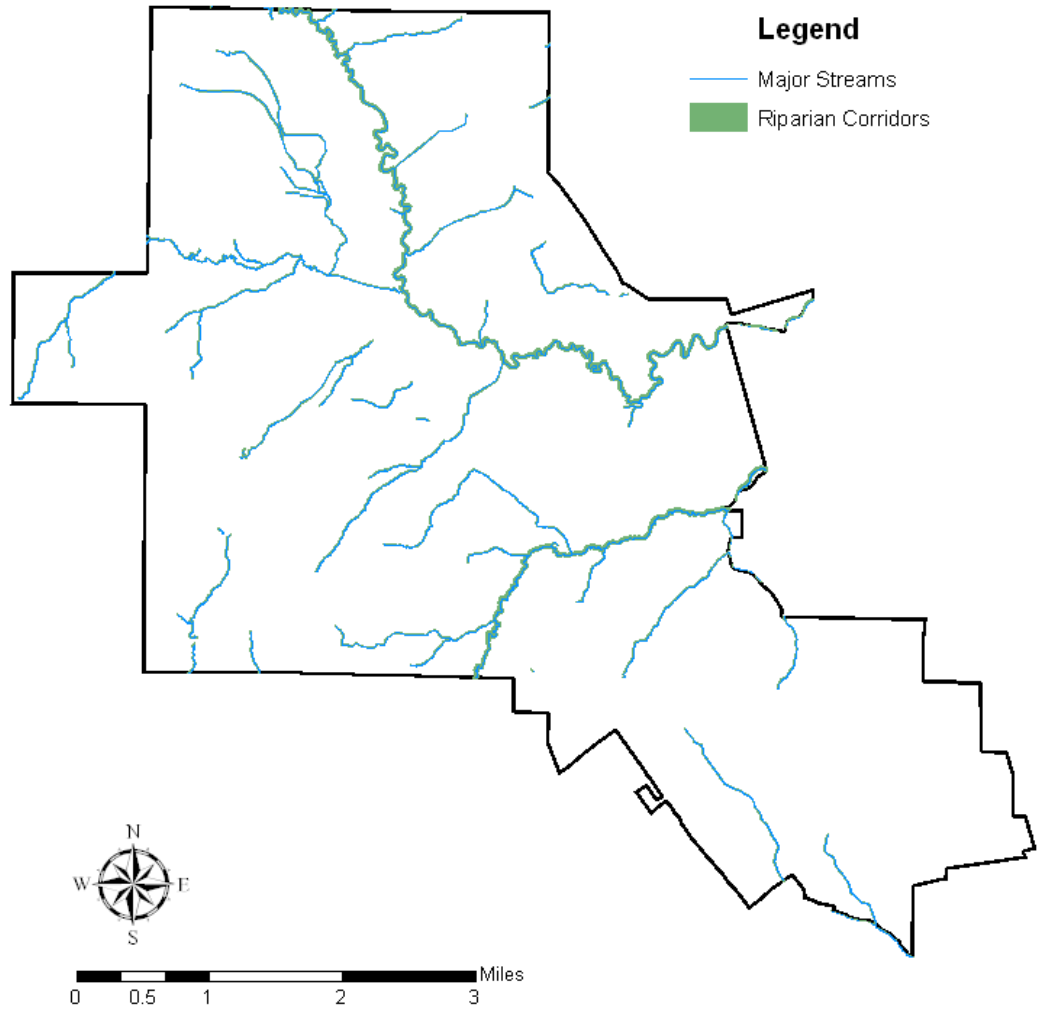
within a watershed can cause both quantitative and qualitative problems. Without detention or other means of control (infiltration, bioretention, etc.), large areas of impervious surface increase the rate (velocity) and volume of runoff that enter our waterways. These increases can then result in increased frequency, duration, and magnitude of downstream flood events, increased pollutant loading from non-point sources, exaggerated channel degradation, lateral bank erosion, increased temperatures, and decreases in dissolved oxygen. Through the use of GIS, areas can be identified in which the potential for this “urban stream syndrome” is high as well as areas in which management strategies, such as riparian buffers zones, may be incorporated to protect areas that may not have as great of impacts and are relatively stable.

In Figures 8, 9, 10, and 11, I have identified some of the major hydrologic features located within Prichard. These features include the major watersheds, streams, wetlands, and flood zones that traverse Prichard in a dendritic and sinuous fashion. By simply overlaying the major stream features with that of the aerial photography and/or that of the land cover layer, one can begin to get a sense of where the potential for impacted streams would be greatest (Figure 19). By doing so, this clearly identifies those streams that service watersheds with a high percentage of impervious surface and would likely exhibit signs of “urban stream syndrome”. This map alone could be used to schedule field analysis, focus restoration and rehabilitation projects for best achievement of best ecological lift value, develop local watershed specific regulations regarding construction site stormwater discharges, and focus stormwater retrofit measures. For the streams that are not within these “critical” zones and may/may not exhibit signs of “urban stream syndrome” or impairment, regulation for protection of stream buffers/riparian corridors can then be applied (Figure 20). Although a zoned approach is recommended, regulation for a uniform 50'-100' buffer on all intermittent or perennial streams could be applied through simple municipal code or ordinance. Although this is a narrow

explanation for this method of use for the GIS that have been presented, it forecast and programs the potential for how the other layers could be analyzed in similar fashion (Ex. Longleaf Pine forests can be documented and special restrictions for development applied through additional code or ordinance).



**Figure 20 – Example Urban Stream Analysis**



**Figure 21 – Example Stream Buffers**

## CONCLUSION

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With a better understanding of the existing conditions of the natural and physical resources of their surroundings and armed with the knowledge necessary to understand how they can be better managed, protect, and restore their form and function, Prichard will in essence gain a better understanding of the importance that the landscape has on their cultural values. Such understands are being realized. On August 9, 2009, a watershed education meeting entitled *Prichard on the Move* was held at the Bill Clark Community Center in Prichard, AL. Sponsored by the Mobile Bay National Estuary Program, city of Prichard, AL and other watershed partners, the objectives of the meeting were to 1) revisit activities that have taken place over the last year or planned over the next year related to the protection and conservation of Prichard's environment and natural resources; 2) begin a process for watershed planning that includes promoting improved health of Prichard residents through the development of passive recreational opportunities; and 3) garner input from the community about potential opportunities to engage people in watershed planning efforts. A power point presentation entitled *Prichard--Yesterday, Today & Tomorrow* was presented by Charlene LeBleu and Kelly Lee of Auburn University summarizing the details of this report. Over 50 stake holders attended. A bus tour of the lower 8-Miler Creek watershed provided stakeholders a view of existing conditions. The tour ended at Reading Park on Boaz Avenue. Reading Creek, the small tributary that flows through the park was assessed as being in need of stabilization and restoration. Though stabilization and restoration is beyond the scope of this study, see Appendix for Reading Park—Existing Conditions; Reading Park Stream Assessment; and Reading Park Preliminary Design. The Mobile Bay National Estuary Program and watershed partners are applying for a grant(s) to restore Reading Creek and promote a stream buffer ordinance within



the city of Prichard to benefit all streams. See Appendix F--Prichard, AL\_Yesterday, Today, & Tomorrow, Appendix G--Reading Park\_Existing Conditions\_March 2010, Appendix H--Reading Park Stream Assessment , and Appendix I--Reading Park Preliminary Design\_Prichard AL.

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