

SECTION THREE NATURAL AND CULTURAL RESOURCES

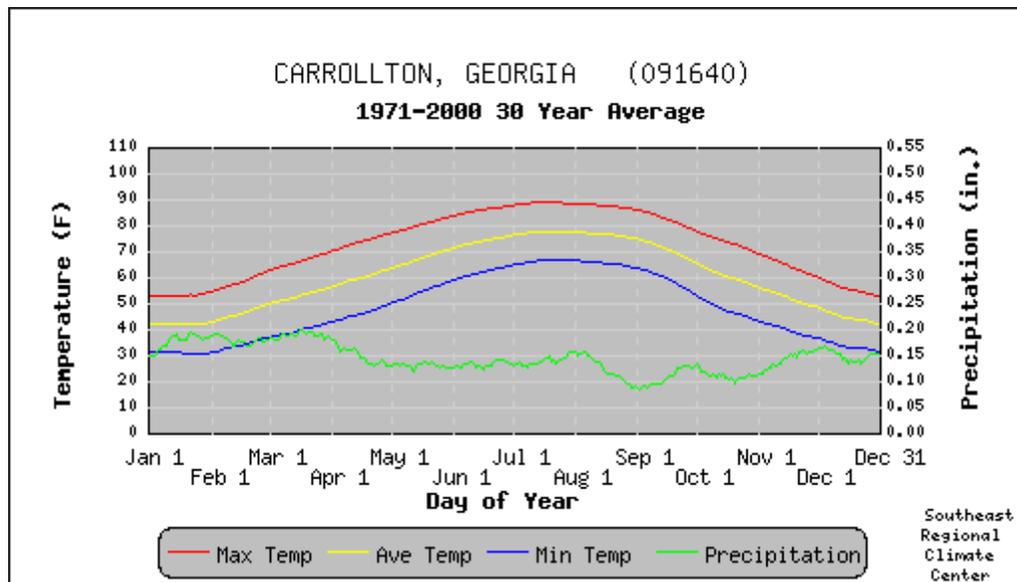
NATURAL ENVIRONMENT

The natural environment places certain opportunities and constraints on the way land is used. Soil characteristics, slope of the land, and flood frequency are a few factors among many that affect where development can safely and feasibly occur. Other areas such as wetlands, prime agricultural and forest areas and sensitive plant and animal habitats, which are particularly vulnerable to the impacts of development, should be given consideration in the planning process and provided appropriate protection. The following examines Villa Rica's natural features as well as its environmentally sensitive and ecologically significant areas.

CLIMATE AND PRECIPITATION

The climate of Carroll County is moist and temperate with short winters and long spring and fall seasons. The County has a mean annual temperature of approximately 62.2 degrees Fahrenheit. Mean annual precipitation ranges from 49 to 53 inches per year. The period of least precipitation occurs from mid summer to late fall. January and March typically receive the most rainfallⁱ. Snowfall averages less than one inch per year.

Exhibit 30: Local Rainfall and Temperature by Month



Hydrologic droughts are frequent in the Southern Piedmont Region, occurring about every 20 years. The most recent drought began in 2000. By the end of 2000, Carroll County had lost almost 30 inches of rain. In response to the drought Carroll County and its municipalities adopted outdoor watering restrictions. As of January 2005 all of Georgia was out of drought conditions.

NATURAL FEATURES

TOPOGRAPHY

Villa Rica lies in the Central Uplands District of the Southern Piedmont Region of the United States. Topography in this area is largely determined by the type of bedrock underlying the soils, by the geology of the area and by the dissection of streams. Relief is generally gently rolling to hilly and includes narrow stream valleys. Elevation in Villa Rica ranges from 1,000 feet to 1,300 feet above sea level. Gently sloping or rolling hills characterizes most of the city's land, although severe slopes can be found along some drainage ways.

STEEP SLOPES

Steep slopes are discussed in the Geology and Soil Characteristics Sections.

GEOLOGY

Schist, biotite gneiss and other metamorphic rock underlie the majority of the Piedmont Plateau. Augen gneiss, hornblende gneiss, granite intrusions and other igneous rocks underlie the remainder. These rock formations have weathered over thousands of years, interacting with various biological processes, to form the soils found in the Villa Rica today.

Depth to bedrock in Villa Rica varies from a few inches to greater than 25 feet, with most areas averaging 10 or more feet. Shallow areas exist in small pockets, located primarily along the west end of Lake Val-Do-Mar and just outside the steep slopes on the lake's north side. Construction of any kind is difficult and costly in areas with shallow depth to bedrock and should be avoided. Shallow depths can also present problems with excessive runoff from rainfall.

Minerals, while present in varying degrees of abundance in the area, do not contribute significantly to the economic well being of the city. Villa Rica is probably best known for its gold mining activities of the 1800s and early 1900s, which produced gold in abundance for a number of years. Today, there are no gold mines in operation.

SOIL CHARACTERISTICS

Soil is the product of parent material (underlying geology), topography, climate, plant and animal life, and time. The nature of soil at any given place depends on the combination of these five factors. Each factor acts on the soil and each modifies the effect of the other four. Because of this interaction, knowledge of soil types in an area provides a good indication of topography (slope), erosion patterns, the presence and depth of rock, and the presence of water, as in wetland and floodplain areas. Soil types are also useful in estimating runoff from precipitation, which is essential in developing stormwater management programs.

The soils in Villa Rica are generally red in color and, with the exception of those found in floodplain areas, are well drained. These soils were formed from a metamorphic and igneous rocks and range in texture from stony, gravelly and sandy loams to clay loams. Much of the original topsoil has been eroded away, leaving red clay subsoil exposed in some areas. Soils of the uplands that have slopes of less than 15 percent are generally thicker and have more distinct horizons than more strongly sloping soils. Soils with slopes of 15 to 40 percent are subject to geologic erosion, which removes soil material almost as quickly as it forms.

Soils in Villa Rica can be grouped into eight associations. The list below shows the soil classifications of Villa Rica. A soil association is a landscape that has a distinctive proportional pattern of soils. It usually consists of one or more major soils, for which it is named, and at least one minor soil. Soils in one association may occur in another, but in a different pattern. Soil associations found in Villa Rica are grouped into three categories according to type and location, as indicated in the following summary. Use limitations related to soil types are defined below.

Soil limitations vary by type and degree. A slight limitation indicates that soil properties are generally favorable for the specified use; any limitation is minor and easily overcome. A moderate limitation indicates that soil properties and site features are unfavorable for the specified use, but that limitations can be overcome or minimized by special planning and design. A severe limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design or intensive maintenance is required. For some soil limitations rated severe, such costly measures may not be feasible.

1. Nearly level soils on bottomlands and low stream terraces:

Because of the flooding hazard, these soils associations have severe limitations if used for utility construction or residential, septic, recreational, commercial or light industrial development. These areas should be limited to suitable wildlife habitat and supporting hardwood stands

Chewacla-Augusta Association

Poorly drained, nearly level soils on frequently flooded bottomlands (floodplains) and low stream terraces. These soils lie along the Little Tallapoosa and Tallapoosa Rivers and along the city's larger streams and creeks.

Conagaree-Buncombe Association

Well-drained to excessively drained, nearly level soils on infrequently flooded bottomlands. These soils lie along the Little Tallapoosa and Tallapoosa Rivers and along the city's larger streams and creeks.

2. Gently sloping and moderately sloping soils of uplands, located throughout the city in slightly to moderately sloping areas outside of the floodplains.

In most areas, limitations are slight for residential and park/recreational development and moderate because of clay for commercial and light industrial development, roads and septic tank drainage fields. However, in the few areas where Louisburg soils predominate, depth to bedrock is very shallow, ranging from a few inches to three feet in depth. In these pockets, which are located at the west end of Lake Val-Do-Mar and just outside the steep slopes on the lake's north side, limitations are severe for most types of utility and building construction and for sanitary facilities.

Madison - Tallapoosa Association

Well-drained micaceous soils with subsoil of red clay or clay loam found on tops and sides of broad and narrow ridges; includes some severely eroded soils.

Hulett-Grover Association

Well-drained soils with subsoil of yellowish-brown to yellowish-red clay or clay loam found on tops and sides of low interstream divides and on low ridges and their sides.

Davidson-Musella Association

Well-drained soils with dark red clay loam or clay subsoil.

Appling-Louisburg Association

Well-drained to excessively-drained strongly acid loamy sands or sandy loams; includes some severely eroded areas.

3. Strongly sloping and steep soils of uplands, located primarily along portions of the major streambanks, along the south side of Lake Val-Do-Mar and in the southern portion of the city beginning just north of Reed Road:

Limitations are moderate for residential, park and road construction on slopes less than 15 percent and severe for all uses on slopes 15 to 40 percent. Development in these areas is also limited by adverse soil properties.

Madison-Louisa-Tallapoosa Association

Well-drained to excessively drained micaceous soils with moderately thick to thin subsoil of red or yellowish-red clay-to-clay loam; includes many severely eroded soils.

Davidson-Musella Association

Well-drained soils with subsoil of dark red clay or clay loam; includes many severely eroded soils.

SOIL EROSION

Soil erosion is fairly prevalent in and around Villa Rica due to soil types that are particularly susceptible to erosion even without man-made intrusions. The amount of erosion that occurs is also influenced by steepness of slope, rainfall intensity and duration, and the construction methods used in development. Excessive erosion can be averted if soil conditions, including composition, permeability, slope and carrying capacity are given careful consideration in the design and construction phases of development. Loss of soil can be minimized through proper installation and placement of control mechanisms such as sediment fences, vegetative cover and retention ponds.

Eroded soil is usually deposited in natural and man-made water channels. Excessive accumulation results in sedimentation, which is the greatest contributor of non-point source pollution. The State of Georgia addresses this problem through the Erosion and Sedimentation Act. Carroll County, Douglas County and the City of Villa Rica have soil erosion control ordinances.

PRIME AGRICULTURAL AND FOREST LAND

The US Department of Agriculture Natural Resources Conservation Service defines prime agricultural land as any soil type ideally suited for the production of crops, timber or livestock. Prime Agricultural Land is a unique resource that is under particular threat in rapidly growing cities such as Villa Rica.

A land use survey conducted in 2003 indicates that approximately 38% of land within Villa Rica's Urban Growth Area (UGA) is vacant or used for agricultural purposes. "The larger tracts of vacant land within the City's UGA are experiencing stronger growth pressures, because parcel size and physical characteristics impose fewer constraints". Although future agricultural land use within the UGA will be extremely limited, growth plans should consider the visual (aesthetic), ecological and economic value this land holds for the present and future residents of the city. Villa Rica Visioning will help determine if there is community wide interest to preserve and protect remaining farmland.

Source: No Food No Farms, Land Use Element (Planning Works LLC)

There is no prime forestry land within the city limits of Villa Rica.

ENVIRONMENTALLY SENSITIVE AND ECOLOGICALLY SIGNIFICANT AREAS

The environment encompasses many areas and resources which are vulnerable to the impacts of development and which require protection by the community. As the city and its surrounding areas continue to grow, the conservation of environmentally sensitive and ecologically significant resources will become increasingly important. In recognizing the importance of land and water resources, the Georgia Department of Natural Resources (DNR) has developed minimum standards for local governments to follow for the protection of water supply watersheds, wetlands and groundwater recharge areas. In addition to these areas, it is important for the community to address the value and protection of such vital and fragile resources as floodplains, steep slopes, prime agricultural and forestland, and sensitive plant and animal habitats.

PUBLIC WATER SUPPLY

The source of raw water for Villa Rica is the Upper Little Tallapoosa River. The City maintains two intakes: one on Cowen's Lake which is fed by Astin Creek, and one on Lake Paradise, which is fed by the Little Tallapoosa River. (See Community Facilities **Map 8**). Douglas County Water and Sewer Authority maintains an intake on The Dog River. A portion of this watershed is located within Villa Rica

WATER SUPPLY WATERSHEDS

Water supply watersheds are defined by DNR as the area where rainfall runoff drains into a river, stream or reservoir used as a source for public drinking water. The majority of the City lies within the Little Tallapoosa River watershed, which serves as the water supply watershed for Villa Rica and the City of Carrollton. A small portion of the City lies within the Dog River watershed that serves Douglas County.

In 2003, the State University of West Georgia’s Center for Water Resources and Hayes James and Associates completed a Watershed Assessment and Management Plan for Carroll County and its municipalities. Villa Rica served as the contracting agency and funds administrator for the project, which was funded by the State of Georgia. The project included an assessment of existing conditions in the watershed, water quality and biological monitoring, modeling and recommendations for best management practices.

The resulting report stated, “The Assessment is necessary for the governments within Carroll County to expand or build new water supply or wastewater treatment facilities. The Georgia Environmental Protection Division (GAEPD) requires municipalities to conduct watershed assessments as part of the permitting process for new wastewater discharges and surface water intakes. To obtain a new permit, the county or municipality is required to develop a management plan that addresses nonpoint source pollution within the service area of the water or wastewater treatment plants. Without advance planning, permits for plant expansions or new facilities could be delayed. Advance planning must consider point sources and non-point sources of pollution, wet and dry flow conditions, impacts of growth and development; and upstream and downstream impacts that lie within and beyond your local jurisdiction.”

During the assessment four sampling stations located in Villa Rica were monitored weekly over the course of one year (see map below). Results showed all sampled streams to be in compliance with Federal and State water quality standards.

Exhibit 31: Villa Rica Stream Sampling Data

Station	Sample Station Location	Reason for/ Description of Location	Compliance
63	Little Tallapoosa River at Lake Paradise Road	Upper most access point for Little Tallapoosa River. Sample station located downstream of Lake Paradise. Part of drinking water supply for City of Villa Rica.	Yes
54	Mud Creek at North Van Wert Road	A tiny watershed that flows through large industrial park and some residential land uses. Sample station is down stream of Villa Rica Waste Treatment Plant.	Yes
53	Mud Creek at Hwy 101	A tiny watershed that heads in a cow pasture inside the City of Villa Rica. Sample station located where creek exits cow pasture.	Yes
64	Little Tallapoosa River at Hwy 78	Represents a large developing watershed with a mix of commercial, industrial, residential, urban, suburban, agricultural, and institutional land uses. Sample station is downstream of City of Villa Rica. Rapid and extensive residential development occurring in and around Villa Rica.	Yes

Sampling detected low dissolved oxygen (DO) levels at sampling points 64 and 63. The report cautions that although the probable cause of low DO levels at 64 is a natural phenomena, further monitoring is necessary to rule out the possibility that the Villa Rica WPCP is contributing to the problem.

WETLANDS

Federal law defines freshwater wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Under natural conditions, wetlands help to maintain and enhance water quality by filtering out sediments and associated non-point source pollutants from adjacent land uses. They also store water, thereby stabilizing dry weather stream flows and flood hazards. In addition, wetlands serve important functions as fish, wildlife and plant habitats.

To avoid long-term impairment, land use in wetlands should be limited to timber production and harvesting, wildlife and fisheries management, wastewater treatment, recreation, natural water quality treatment or purification and other uses permitted under Section 404 of the Federal Clean Water Act.

Wetlands within Villa Rica are generally located in the areas surrounding the two lakes and the City's major streams (**Map 1**).

GROUNDWATER RECHARGE AREAS

Recharge is the process by which precipitation infiltrates soil and rock to add to the volume of water stored in pores and other openings within them. Aquifers are soils or rocks that yield water to wells. While recharge takes place throughout practically all of Georgia's land area, the rate or amount of recharge reaching underground aquifers varies from place to place depending on geologic conditions. Recharge areas in Villa Rica are shown on **Map 1**.

Most of northern Georgia is underlain by crystalline rocks with complex geologic character and with little or no porosity within the rocks themselves. While the overall porosity tends to be low, the rocks do contain joints and fractures along which groundwater can move. A weathered zone called saprolite, which is relatively porous, overlies the crystalline rocks. Precipitation infiltrates downward into the soil and saprolite and fills fractures and joints in the rock where they occur. Well water can be obtained either from the saprolite or from the fractures in the rock; however, the most reliable sources of groundwater are from zones where the bedrock has been intensely fractured.

Unfortunately, the relatively flat areas of thick soil are also choice sites for commercial and industrial development as well as for sanitary landfills. For this

and other reasons, DNR has established standards to protect recharge areas. The City of Villa Rica has also adopted a groundwater recharge ordinance.

PROTECTED RIVERS AND MOUNTAINS

There are no protected Rivers or Mountains within the city limits of Villa Rica.

FLOODPLAINS

Floodplains in their natural undisturbed state are important water resources serving three major functions: water storage and conveyance, water quality management and groundwater recharge. Development of floodplains has the potential to destroy both the property and lives of the owners as well as the functions of the floodplains.

Floodplains in the City of Villa Rica are located along waterways such as rivers, streams, and lakes. Existing floodplains can be seen on **Map 1**. The two major waterways in the city are the Little Tallapoosa River in the west and Lake Val-Do-Mar and associated feeder streams in the east.

AREAS OF SPECIAL FLOOD HAZARD

The Federal Emergency Management Agency has identified and mapped flood-prone areas in Villa Rica based on a potential 100-year or base flood. This is the national standard on which floodplain management and insurance requirements are based. Development in these areas should be carefully monitored to protect floodplain integrity as well as the health and safety of residents.

Also Villa Rica participates in the National Flood Insurance Program, allows a program that property owners to purchase federally subsidized flood insurance. The City has a flood damage prevention ordinance that regulates development in floodplains to reduce flood loss. As part of its stormwater management program, Villa Rica will also adopt a Floodplain Management Ordinance. This Ordinance will designate flood-prone areas within the City based on a build-out scenario and govern land use within these areas.

VEGETATION AND WILDLIFE

Pine Oak hickory association with willow-beech poplar in riparian zones. Wildlife includes turkey, waterfowl, morning doves & bobwhites. Deer, beaver, rabbit, and squirrel (pg 41 cccp draft)

The Tallapoosa River Watershed is home to a number of rare and endangered animal and plant species.

The Georgia Department of Natural Resources, Wildlife Resources Division has created a special concern list of federally protected, state protected and other rare or imperiled animals and plants.

The chart on the following page lists special concern animals and plants in Carroll County, Georgia.

Exhibit 32: Special Concern Animals and Plants in Carroll County.

<u>PROTECTION STATUS</u>	<u>ANIMALS</u>
<u>GA</u>	<u>CYPRINELLA GIBBSI TALLAPOOSA SHINER</u>
<u>GA</u>	<u>ETHEOSTOMA TALLAPOOSAE TALLAPOOSA DARTER</u>
<u>GA</u>	<u>FUNDULUS BIFAX STIPPLED STUDDISH</u>
	<u>HYBOPSIS LINEAPUNCTATA LINED CHUB</u>
	<u>ICHTHYOMYZON GAGEI SOUTHERN BROOK LAMPREY</u>
	<u>LYTHRURUS ATRAPICULUS BLACKTIP SHINER</u>
	<u>MICROPTERUS CATARACTAE SHOAL BASS</u>
	<u>MOXOSTOMA SP. 1 GREYFIN REDHORSE</u>
<u>GA</u>	<u>NOTROPIS HYSILEPIS HIGHSKALE SHINER</u>
<u>GA</u>	<u>NOTURUS FUNEBRIS BLACK MADTOM</u>
<u>GA</u>	<u>PERCINA SP. CF. MACROCEPHELA MUSCADINE DARTER</u>
	<u>PHENACOBIUS CATOSTOMUS RIFFLE MINNOW</u>
	<u>PIMEPHALES VIGILAX BULLHEAD MINNOW</u>
	<u>SCARTOMYZON LACHNERI GREATER JUMPROCK</u>
	<u>PLANTS</u>
<u>GA</u>	<u>HEXASTYLIS SHUTTLEWORTHII VAR. HARPERI HARPER'S HEARTLEAF</u>
<u>US</u>	<u>PLATANThERA INTEGRILABIA MONKEYFACE ORCHID</u>
<u>GA</u>	<u>SCHISANDRA GLABRA BAY STARVINE</u>
<u>GA</u>	<u>WALDSTEINIA LOBATA PIEDMONT BARREN STRAWBERRY</u>

SOURCE: GEORGIA DNR NATURAL HERITAGE PROGRAM

"US" INDICATES SPECIES WITH FEDERAL PROTECTION STATUS AND ALSO STATE PROTECTION STATUS.

"GA" INDICATES SPECIES WITH STATE PROTECTION STATUS.

*BLANK SPACE INDICATES NO PROTECTION STATUS.

The following chart lists special concern animals and plants in Douglas County, Georgia.

Exhibit 33: Special Concern Animals and Plants in Douglas County.

<u>PROTECTION STATUS</u>	<u>Animals</u>
<u>GA</u>	<u>NOTROPIS HYPISILEPIS HIGHSCALE SHINER</u>
	<u>SCARTOMYZON LACHNERI GREATER JUMPROCK</u>
	<u>PLANTS</u>
<u>US</u>	<u>AMPHIANTHUS PUSILLUS POOL SPRITE</u>
	<u>ARABIS MISSOURIENSIS MISSOURI ROCKCRESS</u>
<u>GA</u>	<u>CYPRIPEDIUM ACAULE PINK LADYSLIPPER</u>
<u>GA</u>	<u>CYPRIPEDIUM PARVIFLORUM VAR. PUBESCENS</u> <u>LARGE-FLOWERED YELLOW LADYSLIPPER</u>
	<u>PANAX QUINQUEFOLIUS AMERICAN GINSENG</u>
<u>GA</u>	<u>SCHISANDRA GLABRA BAY STARVINE</u>
<u>GA</u>	<u>WALDSTEINIA LOBATA PIEDMONT BARREN</u> <u>STRAWBERRY</u>

SOURCE: GEORGIA DNR NATURAL HERITAGE PROGRAM

“US” INDICATES SPECIES WITH FEDERAL PROTECTION STATUS AND ALSO STATE PROTECTION STATUS.

“GA” INDICATES SPECIES WITH STATE PROTECTION STATUS.

*BLANK SPACE INDICATES NO PROTECTION STATUS.

MAJOR RECREATION AND CONSERVATION AREAS

Currently there are no major Federal, State or regional recreation and conservation areas located in Villa Rica. The City’s existing parks are local in nature and are discussed in the Community Facilities Element, Chapter 7.

SCENIC VIEWS AND SITES

There is a scenic view of the valley, which the city of Villa Rica is located, from Georgia Highway 61 as one approaches Interstate 20.

Van Wert Road, part of which is located within the City of Villa Rica, is considered a scenic road with rural and agricultural landscapes.

WATER RESOURCE DISTRICT ORDINANCE

The City of Villa Rica developed ordinances to protect its water resources using guidance from the Department of Natural Resources and Department of Community Affairs. This ordinance delineates three water resource districts:

- Groundwater Recharge Area District
- Wetlands District
- Water Supply Watershed District

These ordinances regulate land use and impose impervious surface limits for new development. The ordinances govern the entire city limits of Villa Rica including the portion of city that lies in Douglas County. The ordinances are included within the City of Villa Rica zoning ordinance.

FLOOD HAZARD ORDINANCE

Villa Rica's Flood Hazard Ordinance delineates areas of flood hazard as prepared by the Federal Emergency Management Agency by the FEMA.

WATER MANAGEMENT PLANS

In 2001 the Metropolitan North Georgia Water Planning District was formed to develop plans for stormwater and wastewater management, water supply and conservation in a 16-county area that includes Douglas County. Villa Rica has a stormwater management plan that incorporates regulatory actions, educational outreach and monitoring activities to minimize the impact of stormwater.

The goals and strategies of the plan are outlined in a Villa Rica's Notice of Intent, filed with the State's Environmental Protection Division. The City has adopted the following stormwater management ordinances:

- Post Development Stormwater Management for New Development and Redevelopment Ordinance
- Floodplain Management/ Flood Damage Prevention Ordinance
- Conservation Subdivision / Open Space Development Ordinance
- Illicit Discharge and Illegal Connection Ordinance
- Litter Control Ordinance
- Stream Buffer Ordinance

CULTURAL RESOURCES

Cultural resources are addressed in the Historic Resources and Community Facilities Sections.
