

City of Conway Comprehensive Plan The Natural Resources Element



The Natural Resource Element includes information concerning forest land, plant and animal habitats, unique park and recreation areas, unique scenic views and sites, wetlands, soil types, the watersheds including flood plain and flood way areas, mineral deposits, air quality and water quality (*Comprehensive Planning Guide for Local Governments 2018*).

BACKGROUND AND EXISTING CONDITIONS

The discussion of natural resources does not lend itself well to defined boundaries such as city limits or water and sewer service areas. While actions within these areas affect the quality of a natural resource or existence of a plant or animal within a boundary, many times the impact is more far reaching than just within a defined geographic delineation. For the purposes of the comprehensive plan and the natural resource element, the information provided may be related to, for example, an entire ecoregion or a river basin.

Natural resources are those resources that occur within the environment in their natural form, undisturbed by humanity. They take years to form. While a few of them are used for survival such as water and air, the rest are used for satisfying our daily needs. With the population of Conway ever increasing, the issue becomes one of natural resources management, as well. Natural resources are limited and must be conserved for future generations.

The Coastal Plain

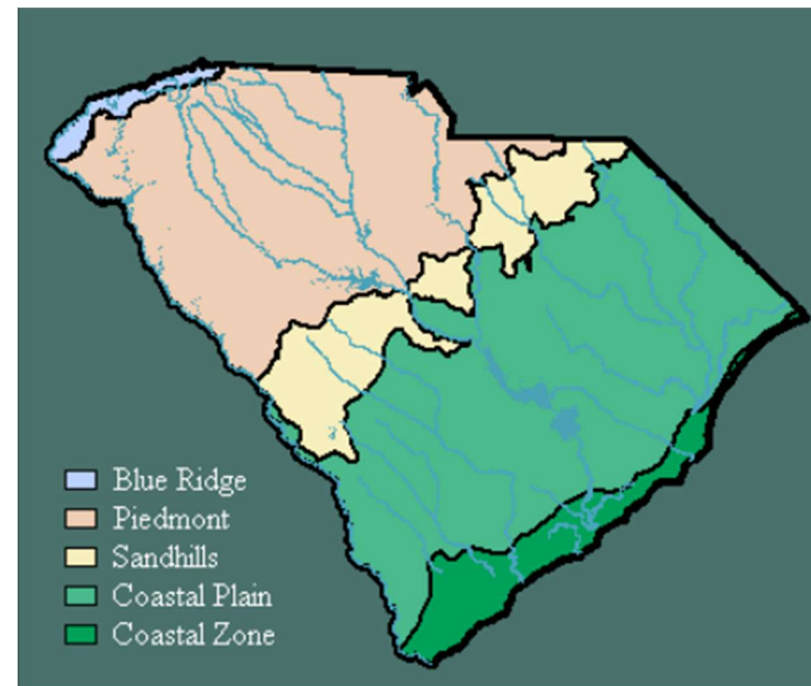
Conway is located within the Middle Atlantic Coastal Plain ecoregion of South Carolina; more specially, the Carolina Flatwoods ecoregion. An ecoregion is an area defined by environmental conditions and natural features; a region defined by its ecology (*Environmental Protection Agency (EPA) 2019*).

The Middle Atlantic Coastal Plain consists of low elevation, flat plains with many swamps, marshes and estuaries. Forest cover mainly consists

of loblolly with scattered shortleaf pine, relict longleaf pine stands, with patches of oak, gum, maple, pond pine, and cypress associated with low areas, wetlands, and major streams (*Natureserve, USFS, the Longleaf Alliance*).

Longleaf pine flatwoods, longleaf pine savannas, freshwater marshes, pond pine woodlands, pocosins, and some sandhill communities were once common; however, loblolly pine plantations are now widespread with an active forest industry (*EPA*). The Carolina Flatwoods ecoregion, a level IV ecoregion, has a physiography of flat plains of lightly dissected marine terraces, swamps, low gradient streams with sandy and silty substrates (*EPA*). **Map NR-1** (below) shows the ecoregions of South Carolina (*SCDNR*).

Map NR-1: South Carolina Ecoregions



Source: S.C. Dept. of Natural Resources (SCDNR)

Land use and cover of the ecoregion includes pine plantations, mixed forestry, forested wetlands, cropland of cotton, corn, soybeans, wheat, peanuts, tobacco, blueberries, production of hogs, broilers and turkeys, as well as public land and wildlife habitats (EPA).

From a land use standpoint, the coastal plain consists of two significantly different landscapes. An inner belt is predominately composed of cropland with forests limited to small patches and hardwood “stringers” along creeks. An outer belt, sometimes called the “flatwoods”, is primarily pine-dominated forests. Bisecting both belts are major floodplains, which are largely forested (SCDNR).

There are eight major habitats defined for the Coastal Plain; six of which are either unique to the region or that reach their greatest extent there. The most predominant habitat types that the most casual observers associate with the Coastal Plain:

- Grassland and early successional habitats
- Pine woodland
- River bottoms

Grasslands / early successional fields include those with cover provided by grasses and/or weeds and with few, if any, trees. These sites also include managed open areas such as meadows, pastures, golf courses or expansive lawns with or without damp depressions. These fields occur throughout the region; more extensively, in the inner “agricultural belt” (SCDNR).

Pine woodlands include all pine-dominated forests throughout the ecoregion. They include tracts that occupy a variety of soil moisture characteristics except floodplains. The canopy is dominated by one or several species of pine, generally loblolly, or longleaf depending on elevation, soil type and silvicultural history. Dense shrub thickets of hollies and wax myrtle may be found throughout stands (SCDNR). Natural Strands of varied vegetation provide habitats for many species of birds, beneficial insects, amphibian, bats, small mammals; as well as for neo-

tropical migratory birds, endemic species of plants, and rare listed animals.

River bottoms of the Coastal Plain include a variety of hardwood and hardwood-pine communities occupying the floodplains of small streams and infrequently flooded flats in association with streams or rivers. These flats are often characterized by the presence of American beech and occur in several scattered locations on sheltered sites with moist soils, particularly on north facing river bluffs and on slopes of drains and creeks (SCDNR). Large, intact stands of bottomland hardwoods and cypress/tupelo swamp forest communities are extremely important to forest interior neo-tropical migratory birds and as habitat corridors to bears (USFWS).

Slope Characteristics

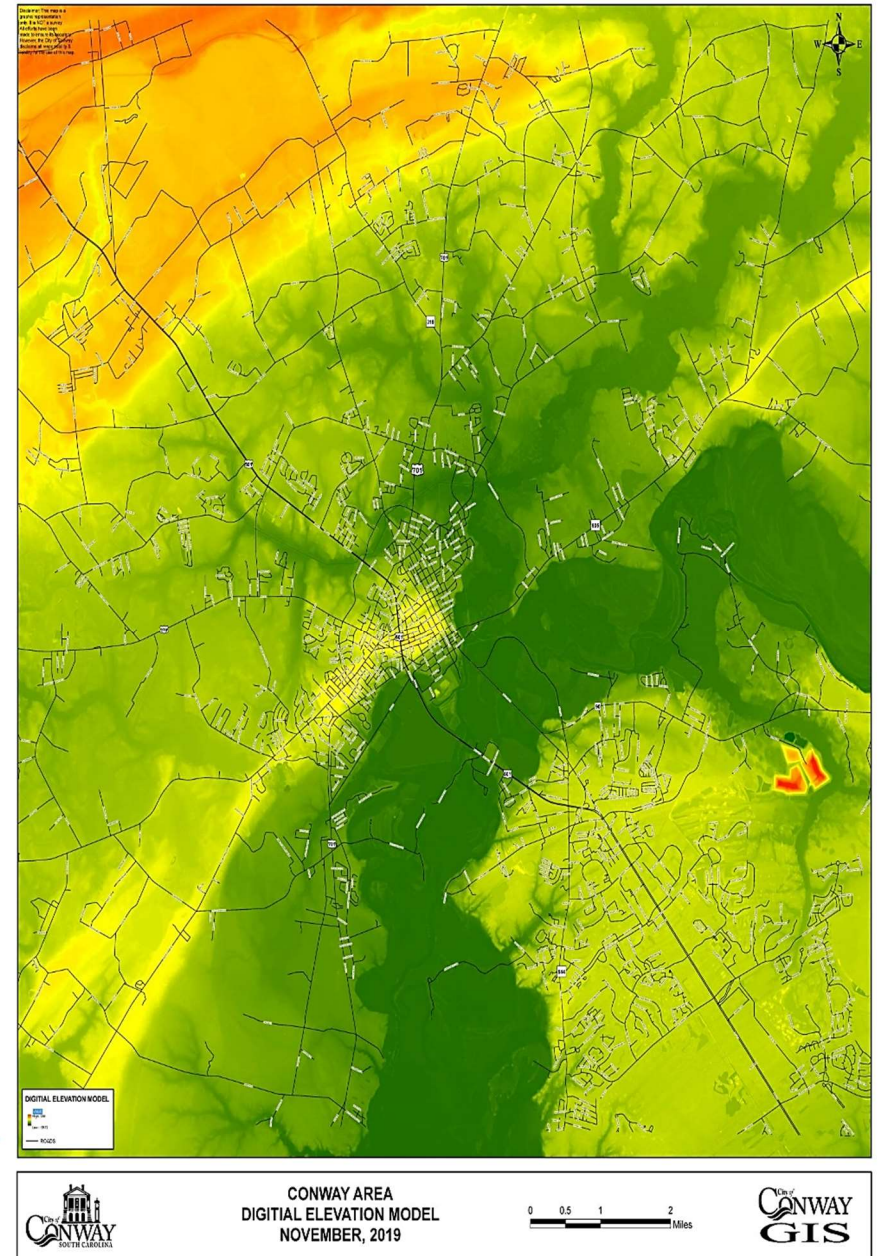
The elevation in Conway above sea level generally ranges from 15 to 50 feet above mean sea level unless immediately adjacent to a body of water (i.e. at the Conway Marina). The bottomland to the south and east of the City is generally flat, poorly drained and swampy. The slopes from the upland areas to the north and west of the City are gradual (*Shaping the Future 2007*). **Map NR-2** (right) provides a digital elevation model of the Conway area.

DIGITAL ELEVATION MODEL

VALUE
High: 166
Low: -39.71

ROADS

Map NR-2: Digital Elevation Model of the Conway Area



Soil

Why Is Soil Important?

Soil provides ecosystem services critical for life (*Soil Science Society of America*). Soil performs five essential functions:

- Acts as a water filter and growing medium
- Provides habitat for billions of organisms
- Supplies most of the antibiotics used to fight diseases
- Humans use soils as a holding facility for solid waste, filter for wastewater and foundation for cities and towns
- Soil is the basis of our nation's agroecosystems that provide feed, fiber, food and fuel

Clean air and water, bountiful crops and forests, productive lands for grazing, a diverse wildlife and beautiful landscapes are all dependent upon a healthy soil performing these essential functions (*USDA: Natural Resources Conservation Service Soils*).

Types of Soil in Conway

There are approximately 26 types of soil in the City of Conway. They range from sand to loam, with sand being predominant.

The most common (soil) is Meggett (Me), which is a loam and makes up approx. 17% of the soil in Conway. Loam consists of a crumbly mixture of varying proportions of clay, silt, and sand. Meggett soil is found in Southern Coastal Plains, Atlantic Coast Flatwoods, and Tidewater areas. It is a poorly draining soil. Flooding can be none to frequent for brief to long periods. The permeability is slow.

Eulonia (EuA and EuB) loamy fine sand is present as 12.6% of the soil. It is a loamy fine sand, which is comprised of sand with varying amounts of silt and clay. It drains moderately well. The permeability is slow.

The third largest soil type in Conway is Wahee (Wa). It is a fine sandy loam and drains somewhat poorly. The permeability is slow. It makes up 12% of Conway's soil (*Custom Soil Resource Report; USDA; NRCS; Soil Series.sc.egov.usda.gov/OSD; Planting Conway's Future Using Trees*).

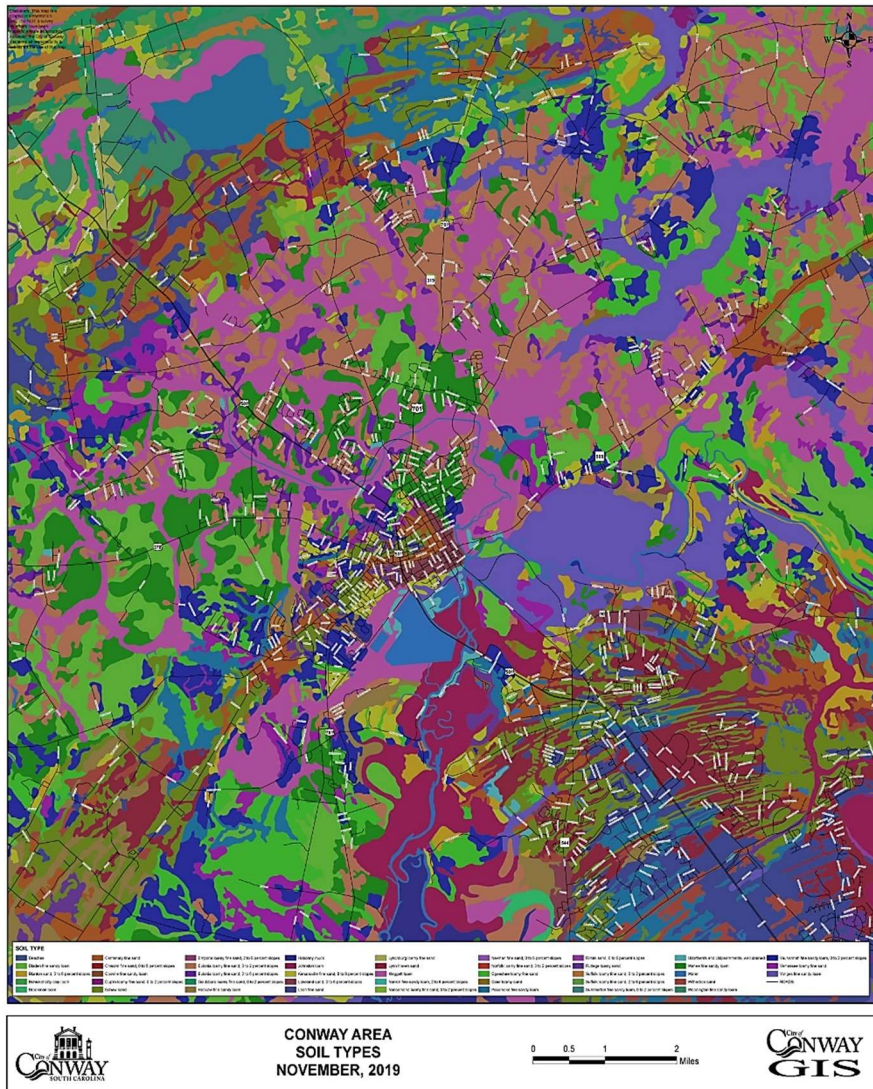
Table NR-1 (below) proves a list of soil types in Conway and **Map NR-3**, on the following page, provides a map of Conway's soil types.

Table NR-1: Custom Soil Types for City of Conway

NAME OF SOIL	TYPE OF SOIL	DESCRIPTION OF SOIL	PERCENTAGE IN CONWAY
Bladen (Ba)	Fine sandy loam	Sand with varying amounts of silt and clay	1.9
Blanton (BaA)	Sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	0.10
Centenary (Ce)	Fine sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	4.0
Echaw (Ec)	Sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	8.7
Eulonia (EuA)(EuB)	Loamy fine sand	Sand with varying amounts of silt and clay	12.6
Hobcow (Ho)	Fine sandy loam		0.80
Hobonny (Hy)	Muck	Soils that are saturated more than 30 cumulative days in normal years or are artificially drained	0.10
Johnston (Jo)	Loam	Soil consisting of a crumbly mixture of varying proportions of clay, silt and sand	3.6
Kenansville (KeB)	Fine sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	3.5
Lakeland (LaB)	Sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	3.1
Leon (Le)	Fine sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	3.6
Lynn Haven (Ly)	Sand	Loose granular materials that results in the disintegration of rocks. Soil containing 85% sand a maximum of 10% clay	10.2
Meggett (Me)	Loam	Soil consisting of a crumbly mixture of varying proportions of clay, silt and sand	16.9
Ogeechee (Og)	Loamy fine sand	-----	0.80
Osier (Os)	Loamy sand	-----	0.20
Pocomoke (Po)	Fine sandy loam	-----	1.7
Rutlege (Ru)	Loamy sand	-----	1.3
Suffolk (SfA)	Loamy fine sand	-----	0.10
Udortments & Udipsamments (Ud)	Well drained	-----	1.5
Wahee (Wa)	Fine sandy loam	-----	12.0
Water (W)		-----	5.8
Witherbee (We)	Sand	-----	0.2
Yauhannah (YaA)	Fine sandy loam	-----	4.9
Yemassee (Ye)	Loamy fine sand	-----	1.5
Yonges (Yo)	Fine sandy loam	-----	1.0
Total For Areas of Interest		Total Acreage: 8,145.1	100.0%

Source: Custom Soil Resource Report for Horry County, SC: City of Conway

Map NR-3: Conway's Soil Types



Map NR-3 legend (enlarged):

Soil Type

Beaches	Centenary fine sand
Bladen fine sandy loam	Chisolm fine sand, 0 to 6 percent slopes
Blanton sand, 0 to 6 percent slopes	Coxville fine sandy loam
Bohicket silty clay loam	Duplin loamy fine sand, 0 to 2 percent slopes
Brookman loam	Echaw sand
Emporia loamy fine sand, 2 to 6 percent slopes	Hobonny muck
Eulonia loamy fine sand, 0 to 2 percent slopes	Johnston loam
Eulonia loamy fine sand, 2 to 6 percent slopes	Kenansville fine sand, 0 to 6 percent slopes
Goldsboro loamy fine sand, 0 to 2 percent slopes	Lakeland sand, 0 to 6 percent slopes
Hobcaw fine sandy loam	Leon fine sand
Lynchburg loamy fine sand	Newhan fine sand, 0 to 6 percent slopes
Lynn Haven sand	Norfolk loamy fine sand, 0 to 2 percent slopes
Meggett loam	Ogeechee loamy fine sand
Nankin fine sandy loam, 2 to 6 percent slopes	Osier loamy sand
Nansemond loamy fine sand, 0 to 2 percent slopes	Pocomoke fine sandy loam
Rimini sand, 0 to 6 percent slopes	Udorthents and Udipsamments, well drained
Rutlege loamy sand	Wahee fine sandy loam
Suffolk loamy fine sand, 0 to 2 percent slopes	Water
Suffolk loamy fine sand, 2 to 6 percent slopes	Witherbee sand
Summerton fine sandy loam, 0 to 2 percent slopes	Woodington fine sandy loam
Yauhannah fine sandy loam, 0 to 2 percent slopes	
Yemassee loamy fine sand	
Yonges fine sandy loam	
ROADS	

WATER RESOURCES

Public Water Supply

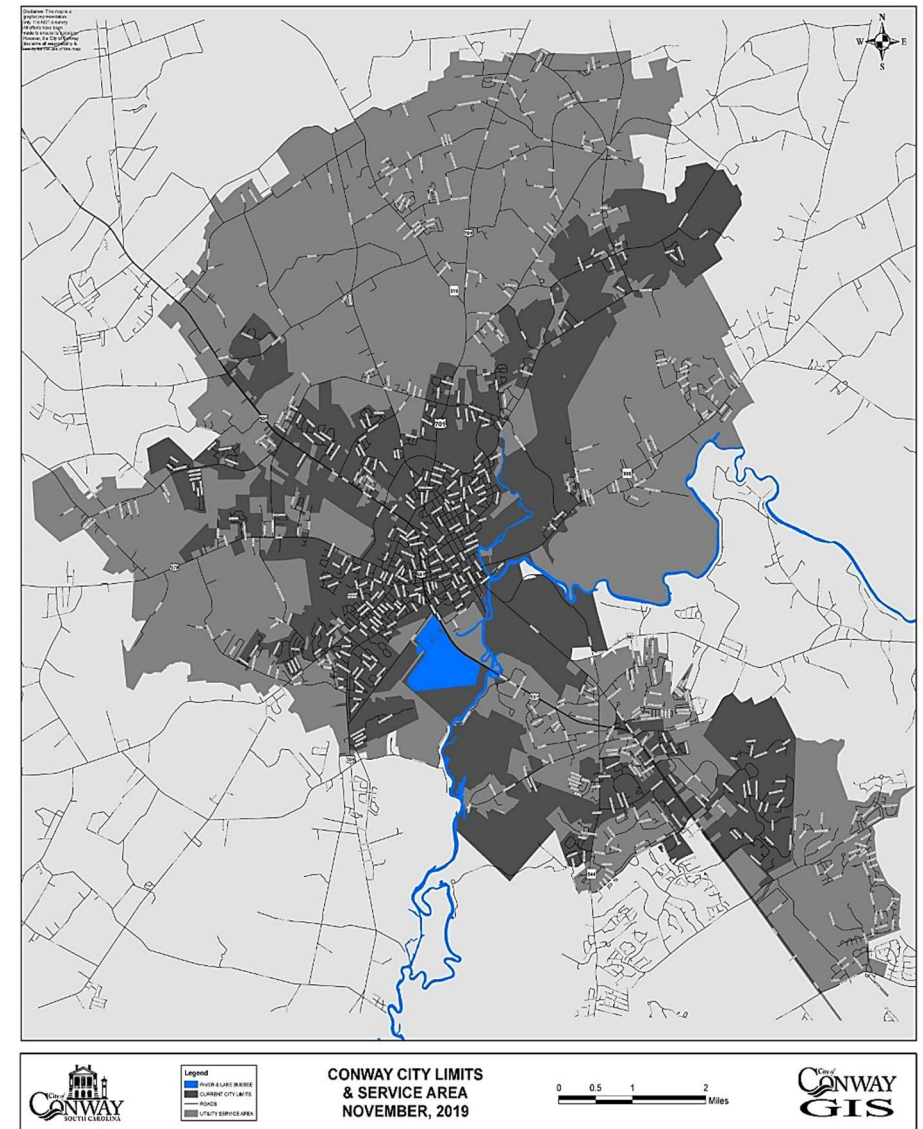
The City of Conway purchases water from Grand Strand Water and Sewer Authority (GSWSA). It is treated surface water from the Great Pee Dee watershed at Bull Creek. Water leaving the treatment plant is tested daily.

The City of Conway has seven elevated storage tanks with a storage capacity of 1.4 million gallons. The City purchases about 3.8 million gallons per day from GSWSA.

DHEC and the EPA prescribe strict regulations which limit the amount of contaminants in water provided by public water systems. The City is required to monitor the distribution system for the presence of coliform bacteria by sampling 37 different points each month. None were found in the monitoring in 2015. The City is also required to test for copper and lead every three years at designated points. Lead and copper samples were pulled in September 2015, and the results were below action levels. The system is tested by DHEC annually for asbestos. No asbestos was found in 2015 (*City of Conway 2016 Water Quality Report and City of Conway Public Utilities Department*).

Map NR-4 (right) depicts the City Limits and the Service Area, as of November 2019.

Map NR-4: Conway City Limits & Service Area (Nov. 2019)



Surface Water Quality

Growing public awareness and concern for controlling water pollution led to the enactment of the Federal Water Pollution Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave the Environmental Protection Agency (EPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also continued requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution (*U.S. Environmental Protection Agency*).

Subsequent enactments modified some of the earlier Clean Water Act provisions. Revisions in 1981 streamlined the municipal construction grants process, improving the capabilities of treatment plants built under the program. Changes in 1987 phased out the construction grants program, replacing it with the State Water Pollution Control Revolving Fund, more commonly known as the Clean Water State Revolving Fund. This new funding strategy addressed water quality needs by building on EPA-State partnerships (*U.S. EPA*).

In 2019, the EPA proposed a new rule on Clean Water Act Quality Certification, which seeks to increase the transparency and efficiency of the 401 certification process and promote the timely review of infrastructure projects while continuing to ensure that Americans have clean water for drinking and creations.

More information on the proposed rule can be found using the link below:

<https://www.epa.gov/newsreleases/what-they-are-saying-epa-issues-proposed-rule-clean-water-act-quality-certification>

The South Carolina Dept. of Health and Environmental Control (SCDHEC) has been delegated authority to implement the provisions of the Clean Water Act through S.C. Regulation 61-68, Water Classifications and Standards and S.C. Regulations 61-69, Classified Waters. Regulation 61-68 establishes water classifications based on designated uses tied to water quality standards and criteria (*Horry Co. Envision 2025; SC DHEC*).

By federal law, the waters classified for regulation under the Clean Water Act are those defined as all the “waters of the United States” (33 CFR Part 328). These generally include all natural surface waters including some wetlands. A complete list of water bodies and their specific classification can be found in S.C. Regulation 61-69, Classified Waters (SCDHEC). For each classification, a set of water quality standards and criteria exist. Failure to maintain these standards is taken as evidence of lack of attainment of designated use. SCDHEC is charged with monitoring compliance with the water quality standards. In order for Conway to comply with the mandates of federal and state law, Conway created a stormwater utility (explained further in the Watershed Protection and Restoration section of this element). It is the intent and purpose of the regulations that waters, which meet the standards shall be maintained, and waters which do not meet standards shall be improved (*Envision 2025*) (SCDHEC, *State of S.C. Integrated Report for 2004, Part II: Assessment and Reporting, 2004*).

Bodies of Water in Conway

The Waccamaw River

The Waccamaw River begins in North Carolina at Lake Waccamaw, a freshwater lake within a Carolina bay. From this lake, the Waccamaw River winds 140 miles through Horry and Georgetown counties. Waters of the Waccamaw River are classified FW*, or “Freshwaters”, from the North Carolina line to its confluence with Thoroughfare Creek, which are suitable for primary and secondary contact recreation and as a source of drinking water supply, after conventional treatment, meeting DHEC requirements. An asterisk by the class (FW) means that the SC DHEC has established site-specific standards for certain parameters for that waterbody. The site-specific standards for this stretch of the Waccamaw River is dissolved oxygen not less than 4.0 milligrams per liter and pH of between 5.0 and 8.5 (pH is a measure of hydrogen ion concentration to indicate the degree of acidity). The pH scale ranges from 0 to 14 standard units (SU). A pH of 7 is considered neutral, values less than 7 being acidic and more than 7 being basic. Low pH values are found in natural waters rich in dissolved organic matter, especially in Coastal plain swamps and black water rivers.

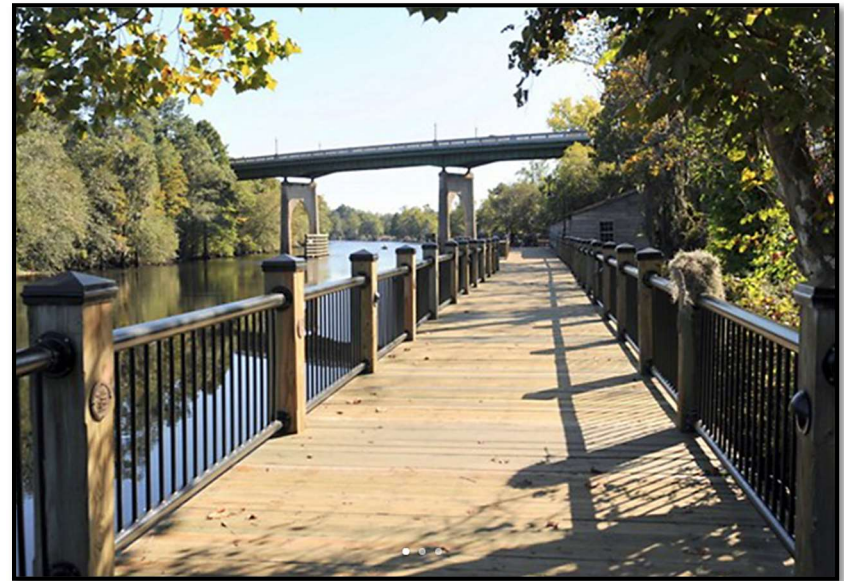
The Waccamaw is a black water river, meaning that its water contains tannin from the leaf debris that decomposes within it. The result is a deep brown-tinted water. Black water rivers are found along the coastal plain and do not contain the clay sediments found in rivers in the middle and upper parts of the state. Like other black water rivers, it is naturally acidic and low in dissolved oxygen (*Winyah Rivers Alliance*).

The Waccamaw River has played a major role throughout history, as it was used as a water route for transporting lumber and other cargo. It continues to play a role in the lives of North and South Carolinians (*Winyah Rivers Alliance*; *SC Picture Project*). Today, the river is a source of recreation. In Conway, the Riverwalk stretches alongside the river,

featuring picnic tables, benches, swings, as well as places to stop and enjoy the view (*SC Picture Project 2019*).

The Waccamaw River is also a National Blue Trail, the Waccamaw River Blue Trail, which extends the entire length of the river in North and South Carolina (*American Rivers, 2019*). The trail begins at Lake Waccamaw (North Carolina), and meanders through the Waccamaw River Heritage Preserve, City of Conway and the Waccamaw National Wildlife Refuge before merging with the Intracoastal Waterway (*American Rivers, 2019*).

Image NR- 1: Waccamaw River at Conway Riverwalk



Source: SC Trails 2019

Lake Busbee

Lake Busbee is a man-made lake that was built to act as a “cooling pond” for the former Grainger Steam Plant, which produced coal power from the time that it opened in 1966 (*SC Picture Project 2019*). There is a 2.3-mile trail which surrounds the lake for walking and biking. SC's state power and water utility, Santee-Cooper, who owned the plant,

determined that it would be too costly to upgrade the plant to meet the EPA's current Mercury and Air Toxin Standards and shut the plant down in 2012. The steam plant's smoke stacks were demolished 2016.

Without an active generating station, there is no longer a need for a cooling pond, and local stakeholders agreed to allow Lake Busbee to return to wetlands. Santee-Cooper planted native saplings; approximately 300-400 trees per acre, to match nearby wetlands. The end result will be a natural wetlands area that should start being recognized as forest land within 10 years (*Santee-Cooper*).

Kingston Lake and Crab Tree Swamp

Kingston Lake and Crab Tree Swamp are classified as streams in Horry County. Kingston Lake accepts drainage from many other bodies of water, including Crab Tree Swamp. Aquatic life and recreational uses are not supported due to dissolved oxygen excursions (aquatic) and due to fecal coliform bacteria excursions (recreational).

While Crabtree Swamp was originally a low gradient coastal plain tributary to the Waccamaw River, the stream system was significantly modified by channelization projects in the 1960s (*U.S. Army Corp of Engineers*) and the 1980s (*U.S. Department of Agriculture (USDA)*). These efforts, spearheaded by the formation of the Crabtree Swamp Watershed Conservation District, aimed to improve drainage for agricultural lands. The outcome was a deep, trapezoidal channel known as Crabtree Canal. This shape has effectively disconnected the channel from its former floodplain. Crabtree Canal now exhibits symptoms of stress such as bank failure, erosive channel velocities, high sediment loads during rain events, episodic flooding, federal 303(d)-listed water quality impairments for dissolved oxygen and fecal coliform, invasive vegetation (e.g. johnsongrass), and poor wildlife habitat quality. However, efforts have been made to improve the bank and flow. Additionally, grants are underway to improve Crab Tree.

Wetlands

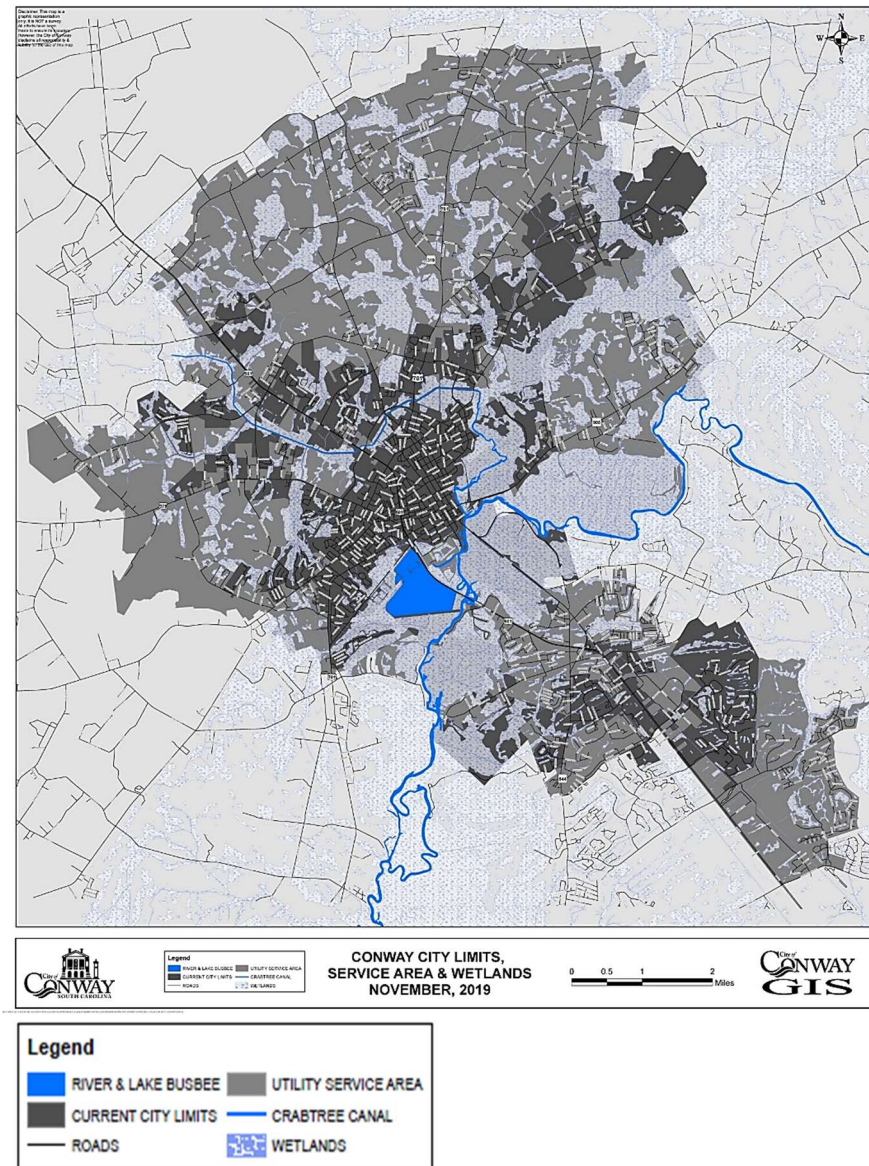
Wetlands, including swamps, marshes, and bogs, are areas of land that are saturated with moisture seasonally or permanently, exhibit certain soil characteristics, and that support specific plant species. Wetlands are believed to be the most diversified ecosystems in the world. Wetlands are home to various species of plants, amphibians, reptiles, birds and mammals. This includes many threatened, endangered and endemic species. Wetlands also act as filters to improve water quality by removing sediments and chemicals. Wetlands also help reduce flooding and recharge ground water. According to Horry County's *IMAGINE 2040*, wetlands make up 38% of Horry County, with the majority being freshwater. **Map NR-5** (next page) shows the Conway City Limits, Service Area, and Wetlands as of November, 2019.

Seasonal Isolated Wetlands and Small Ponds

Seasonal isolated wetlands and small ponds can be found interspersed among pine woodlands, hardwood forests, or grasslands. Seasonal wetlands are typically isolated depressions (e.g. sinkhole ponds, Carolina bays, and vernal pools) that hold water in winter and spring, but are often dry by summer or fall. The source of water is usually rainfall or an elevated water table. Seasonal wetlands are among the most important and imperiled habitats for southeastern amphibians and reptiles. Isolated wetlands are most often small but can range in size from less than one (1) acre to hundreds of acres when considering Carolina bays (*Partners in Amphibian and Reptile Conservation (PARC)*).

Carolina Bays are elliptical depressions that are scattered throughout the Coastal Plain of the eastern United States. Due to their variable size (one to 1,000 acres), depth and substrate conditions, Carolina Bays support plant communities that range from grass-sedge prairies to cypress-gum swamps (*Meador, U.S. Geological Survey; IMAGINE 2040*).

Map NR-5: Conway City Limits, Service Area, and Wetlands (Nov. 2019)



Wetland Regulation

In accordance with the Clean Water Act (CWA), Section 404, a permit is required from the U.S. Army Corp of Engineers (ACOE), or authorized

state, for the discharge of dredged or fill material into the waters of the United States (*Environmental Protection Agency (EPA)*). In South Carolina, several state programs regulate activities in wetland areas that are tied to the federal permitting program. SCDHEC's Bureau of Water must issue water quality certification for every federal permit that allows a discharge to state waters, including wetlands (401 Certification). SCDHEC's Office of Ocean and Coastal Resource Management (OCRM) must certify that any federal action in the coastal zone is consistent with the state's coastal zone management plan (SCCZMP) (*SCDHEC*).

Federal regulations protect jurisdictional wetlands only, leaving highly beneficial and valuable isolated (not connected to a navigable waterway or non-jurisdictional) wetlands vulnerable to destruction or alteration. The Clean Water Act included protections for isolated wetlands but this rule has been repealed (*EPA*). The SC Pollution Control Act (PCA), regulated by SCDHEC, serves as a mechanism to protect isolated wetlands not located within the Army Corps' jurisdiction (*SCDHEC*) (*IMAGINE 2040*). The PCA empowers SCDHEC to hold hearings, promulgate regulations, require permits, monitor, and take enforcement actions (*SCDHEC*).

A lack of understanding of the value of wetlands has resulted in draining or filling for development and farming in the United States. During the last 25 years many federal and state agencies have begun research to expand their knowledge and to protect remaining wetlands.

Threats to Wetlands

Between 1780 and 1980, it is estimated that South Carolina has lost 27% of its wetlands (*Environmental Protection Agency (EPA)*). Human activities are the main cause of wetland degradation and loss by changing water quality and quantity, flow rates, pollutant inputs, and changing species composition as a result of disturbance and the introduction of nonnative species (*EPA*).

Main cause of wetland degradation includes:

- Hydrologic alterations, such as deposition of fill material for development; farming; mosquito control; dredging for navigation and flood control; diversion of flow to and from wetlands; and the addition of impervious surfaces in the watershed (EPA).
- Pollutants, such as runoff from urban, agricultural, silvicultural and mining areas; air pollution from vehicles, factories, and power plants; old landfill dumps that leak toxic substances; and marinas, where boats increase turbidity and release pollutants (EPA).
- Vegetation damage, including grazing by domestic animals; introduction of nonnative plants that compete with natives; and removal of vegetation of mining purposes (EPA).

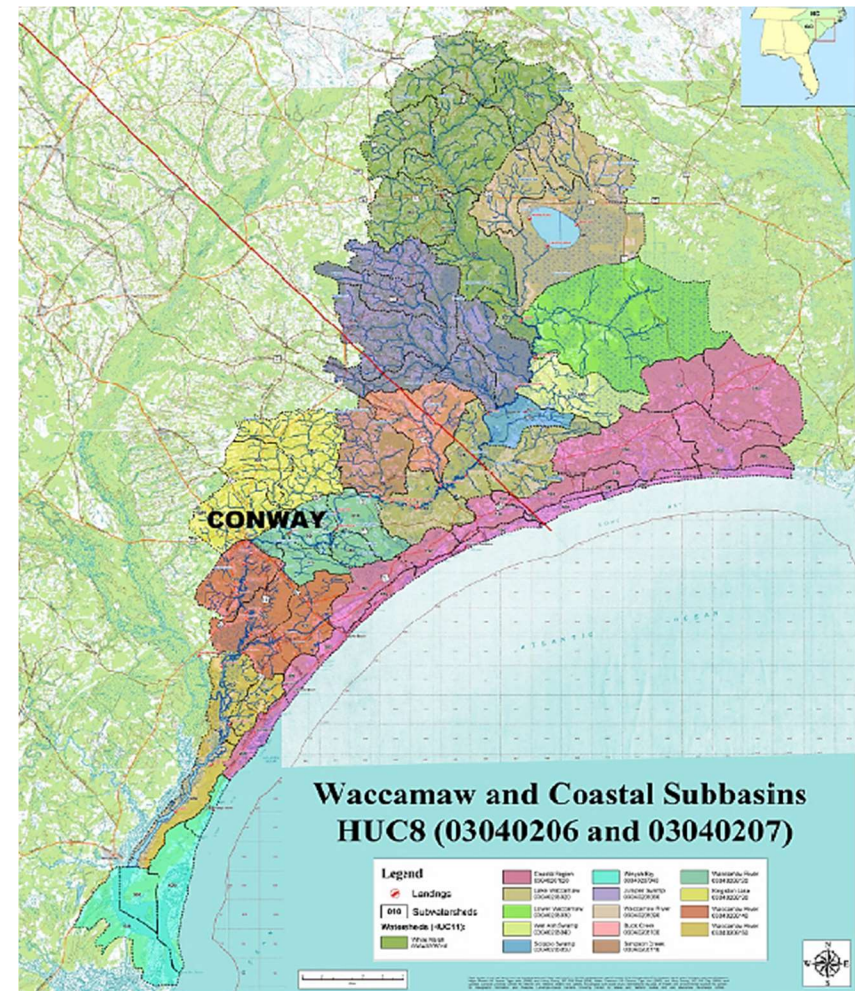
Watersheds, Floodplains and Flood Way Areas

Watersheds – A watershed is an area of land where all the water that falls in it and drains off of it goes to a common outlet. A watershed is a precipitation collector. A watershed can vary in size. The word watershed is sometimes used interchangeably with drainage basin or catchment. Watersheds sustain drinking water, water for agriculture and manufacturing and offer opportunities for recreation. It provides habitat for numerous plants and animals. Various forms of pollution, including runoff, as well as sedimentation from soil erosion, can affect the health of the watershed.

Waccamaw River Subbasin

The Waccamaw River subbasin encompasses over 18,000 square miles and five watersheds in the Carolinas. The Pee Dee and Waccamaw Rivers converge with the Atlantic Intracoastal Waterway to form a flow that empties into the Winyah Bay from the north. The other two major rivers, the Black River and the Sampit River, flow from the west into Winyah Bay. This estuary has the largest watershed on the east coast and is especially unique as it is largely undeveloped (Waccamaw Watershed Academy). The Waccamaw and Coastal Subbasin is depicted on **Map NR-6** (right).

Map NR-6: Waccamaw and Coastal Subbasin

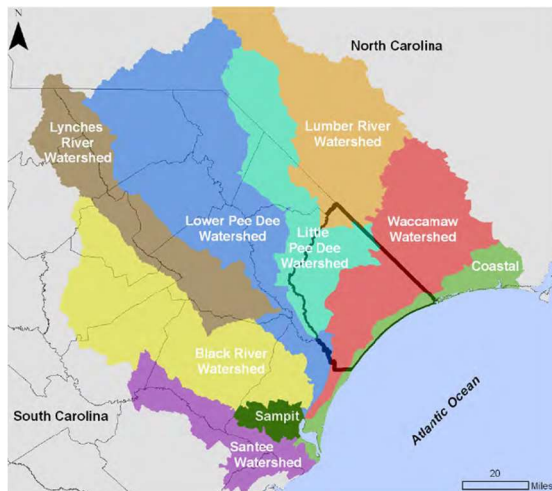


Source: Waccamaw Watershed Academy (WWA)

The Pee Dee River Basin

South Carolina's portion of the Pee Dee River Basin encompasses 45 watersheds and flows from the Piedmont and Sandhills regions of the state to upper and lower Coastal Plain and Coastal Zone regions (SCDHEC 2019). The Pee Dee Basin includes the Lynches River, the Black River, the Waccamaw River, the Great Pee Dee River, and the Pee Dee Coastal Frontage watersheds. The Waccamaw River Basin includes the Waccamaw River, Juniper Swamp and Kingston Lake watersheds. The Great Pee Dee River Basin includes the Great Pee Dee River, Thompson Creek, Black Creek/Lake Robinson, Jeffries Creek, Catfish Creek, Ashpole Swamp, the Lumber River, the Little Pee Dee River, Bridge Creek, Shoe Heel Creek, Buck Swamp, Lake Swamp, Brunson Swamp, the Sampit River and the Winyah Bay watersheds. The Pee Dee Coastal Frontage Basin includes the Little River/Atlantic Coastal Waterway and the North Inlet watersheds, which both drain into the Atlantic Ocean. In South Carolina, there are 17,034 acres of lake waters and 9,495 of stream miles (SCDHEC). **Map NR-7** (below) shows the Pee Dee River Basin and Winyah Bay Watershed.

Map NR-7: Pee Dee River Basin and Winyah Bay Watershed

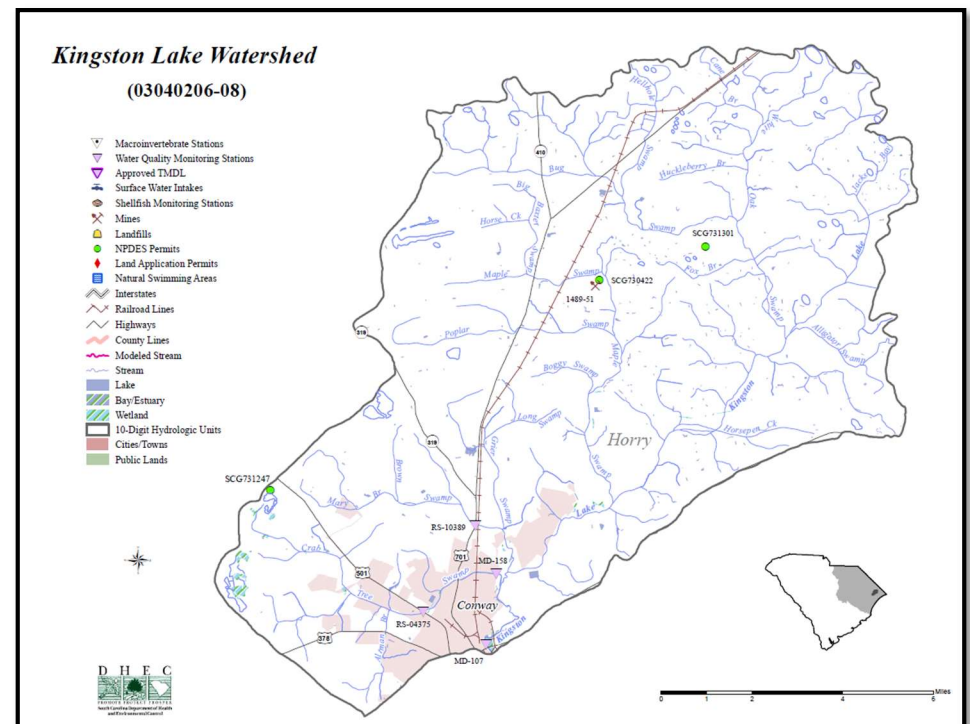


Source: Waccamaw Watershed Academy (WWA)

Kingston Lake Watershed

The Kingston Lake Watershed (KLW) (**Map NR-8** (below)) lies in the northwestern corner of Horry County and encompasses 83,446 acres with a total of 166 stream miles. It contains four tributary creeks that drain into the Waccamaw River. Additionally, Kingston Lake accepts drainage from Jacks Bay, Alligator Swamp, and White Oak Swamp. The Kingston Lake Watershed drains into the Waccamaw River. There are several ponds in the watershed, which total 161.6 acres. The City of Conway is located in the Kingston Lake Watershed (KLW) (Libes & Fuss).

Map NR-8: Kingston Lake Watershed



Source: SCDHEC

Watershed Protection and Restoration

Watershed protection is accomplished by protecting a lake, river, or stream by managing the entire watershed that drains into it.

In 2008, a community-based effort was conducted at the Kingston Lake Watershed for watershed management. This drainage basin, consisting of 130 miles and three sub-watersheds, is located in the Waccamaw River sub-basin in northern South Carolina.

In a paper written by Susan Libes and David Fuss of the Coastal Carolina Watershed Academy, *Community-Based Watershed Planning in the Kingston Lake Watershed of Northeastern South* states that the land use has been shifting from agriculture to residential with rapid development fueled by population growth. They also state that the major threats to environmental quality in this watershed are from polluted stormwater runoff and habitat loss.

The Waccamaw Subbasin, which lies within the Pee Dee Basin, falls within the jurisdiction of four coastal counties, Horry and Georgetown in South Carolina and Columbus and Brunswick in North Carolina (*Libes and Fuss*). This sub-basin contains the Waccamaw River, which flows into the Atlantic Ocean at Winyah Bay. The only city on the river, Conway, is located in the Kingston Lake Watershed.

On November 30, 2003 a workshop entitled "Coastal Development and Watershed Planning: Collaborative Problem Solving to Protect Water Resources" was held hosted by Coastal Carolina University's Waccamaw Watershed Academy. Libes and Fuss's report states 100 stakeholders attended the workshop and identified watershed planning as a priority. An external training consultant recommended developing a single watershed plan that could be used as a model for the Waccamaw Basin. Kingston Lake Watershed was selected because it was on the federal 303(d) list, an upstream source of pollutants covered by a total maximum load, was the successful subject of US EPA 319 Program project, covered by a NPDES Phase II stormwater permit,

and was located in an area of rapid growth. Funding was spearheaded by the Waccamaw Watershed Academy (WWA) for this project. Prior to this project, there had been no watershed planning in northeastern South Carolina, and the state did not have an estuary in the National Estuary Program. Funding was awarded in June 2005 for a period of four years. Additional funding for the project was supplied by local businesses, the City of Conway, Horry County and several South Carolina agencies.

The EPA 2014 Bureau of Water report shows several sites in Conway on the federal 303(d) list of impaired water bodies. The listings are for water quality problems caused by high levels of fecal coliforms and low dissolved oxygen concentrations.

The City of Conway created a stormwater utility in 2003, which provides for the planning and funding of a comprehensive stormwater management program for the City. The goals of this program continue to be preserving the natural environment and enhancing opportunity for economic development in and around the City of Conway. Federal laws, including the Federal Clean Water Act and Water Quality Act – National Pollutant Discharge Elimination System (NPDES) Stormwater Program Phase II, required that Conway establish a stormwater program that addressed six minimum control measures:

1. Public Education and Outreach
2. Public Involvement
3. Illicit Discharge Detection and Elimination
4. Pollution Prevention and Good Housekeeping in Municipal Operations
5. Construction Site Runoff Control
6. Post-construction Stormwater Management in new development and redevelopment

Coastal Carolina University established the Waccamaw Watershed Academy (WWA) in 2004 in order to meet local needs for expertise in the areas of watershed and wetland science and management. Their mission is to deliver educational, research, and public outreach services

to the university and local region. Projects already conducted by the WWA have had a direct positive impact on the economic welfare of our region. It has included determination of sources and levels of contaminant bacteria in the surf zone of the Grand Strand and the Waccamaw River, evaluation of off-shore discharge pipes for dispersion of stormwater runoff, and development of aquifer storage and recovery technology for extending local drinking water resources (WWA).

Crabtree Swamp Stream Restoration Initiative

Established in 2007 by the Kingston Lake Action Network (KLEAN), the Crabtree Swamp Stream Restoration Initiative explores ways to restore Crabtree Swamp. The group is comprised of local agency representatives, including Coastal Carolina University, Waccamaw Watershed Academy, local volunteers, the City of Conway and Horry County, whose goals are to improve the quality and appearance of the Crabtree Canal.

The Crabtree Swamp Restoration Initiative is a locally-driven collaborative, that sought to restore Crabtree Swamp to a more natural state that adheres to or exceeds state and federal water quality standards, minimizes flood damage to people and their property, and provides suitable wildlife habitat (*Fuss, Garigen, Libes and Dignam, 2010*). There are three main objectives: 1) slow the flow of water; 2) increase water storage; and 3) reduce erosion. More intense urban land uses have replaced agricultural land uses over the last 20 years, which has increased stormwater runoff. Bank failure, erosive channel velocities, high sediment loading during rain events, episodic flooding, federal 303(d)-listed water quality impairments for dissolved oxygen and fecal coliform, invasive vegetation and poor wildlife habitat quality are all symptoms of bank stress exhibited by Crabtree Canal. Permission to engage in the work was obtained from property owners in the Crabtree Watershed Conservation District who signed a memorandum of

understanding in 2008 with Horry County and The City of Conway to partner on restoration efforts (*Fuss et al 2010*).

The demonstration project was constructed in 2009, and used a two-stage design to reconnect the channel with the remnant bottomland hardwood floodplain via a sloping riparian bench along the one-half mile of stream. The new channel's configuration provided flood storage and bank stabilization, improved water quality and provided habitat for aquatic and terrestrial species (*Fuss et al 2010*). Strong partnerships, coordination, maintenance guidelines, project assessment and results and enabling of natural processes were important lessons learned by the partners during the project.

The site remains vulnerable to water quality and quantity problems that originate upstream; however, positive results have sustained and broadened partner interest for future restoration phases within the Crabtree Swamp Watershed. Ongoing and sustained assessment work will be important during the life of the project and future restoration work is also needed to address continuing erosion and water quality issues in unrestored stream reaches (*Fuss et al, 2010*).

Crabtree Canal is included in the City's Blueway Trail. While the Initiative wishes to improve the appearance and function of the Canal, the goal is to make the area a public amenity as well. Crabtree Canal is included in the City's Greenway Master Plan efforts for this intended use.

Image NR-2: Steepened Banks of Crabtree Canal prior to restoration (pre-2009)



Image NR-3: Restored floodplain during planting (Crabtree)



Source: Proceedings of the 2012 SC Water Resources Conference

Floodplains and Flood Ways

Floodplains are strips of relatively flat and normally dry land alongside a stream, river, or lake that is covered by water during a flood (*US Geological Survey (USGS)*). Flood stage occurs when the elevation at which the overflow of the natural banks of a stream or body of water begins in the reach or area in which the elevation is measured (*USGS*). Floodplains perform important natural functions. These functions include:

- Temporary storage of floodwaters
- Moderation of peak flows
- Maintenance of water quality
- Groundwater recharge
- Erosion prevention
- Wildlife habitat
- Recreational opportunities.

In Horry County, Conway, and nationally, the term floodplain has come to mean the land area that will be inundated by the overflow of water resulting from a 100-year flood, a flood which has a 1% chance of occurring any given year (*SCDNR, Regulations for Floodplain Management (Envision 2025)*).

Conway has non-tidal floodplains. Non-tidal floodplains are areas consisting of the floodway and the floodway fringe along rivers and streams. The floodway carries the high velocity water, while the floodway fringe is subject to shallow flooding from the low velocity water. These areas are designated as AE or A1-30 zones on the Flood Insurance Rate Map (FIRM). Approximately 24% of Horry County's total land area is composed of 100-year floodplain and is vulnerable to flooding (*Horry County IMAGINE 2040*).

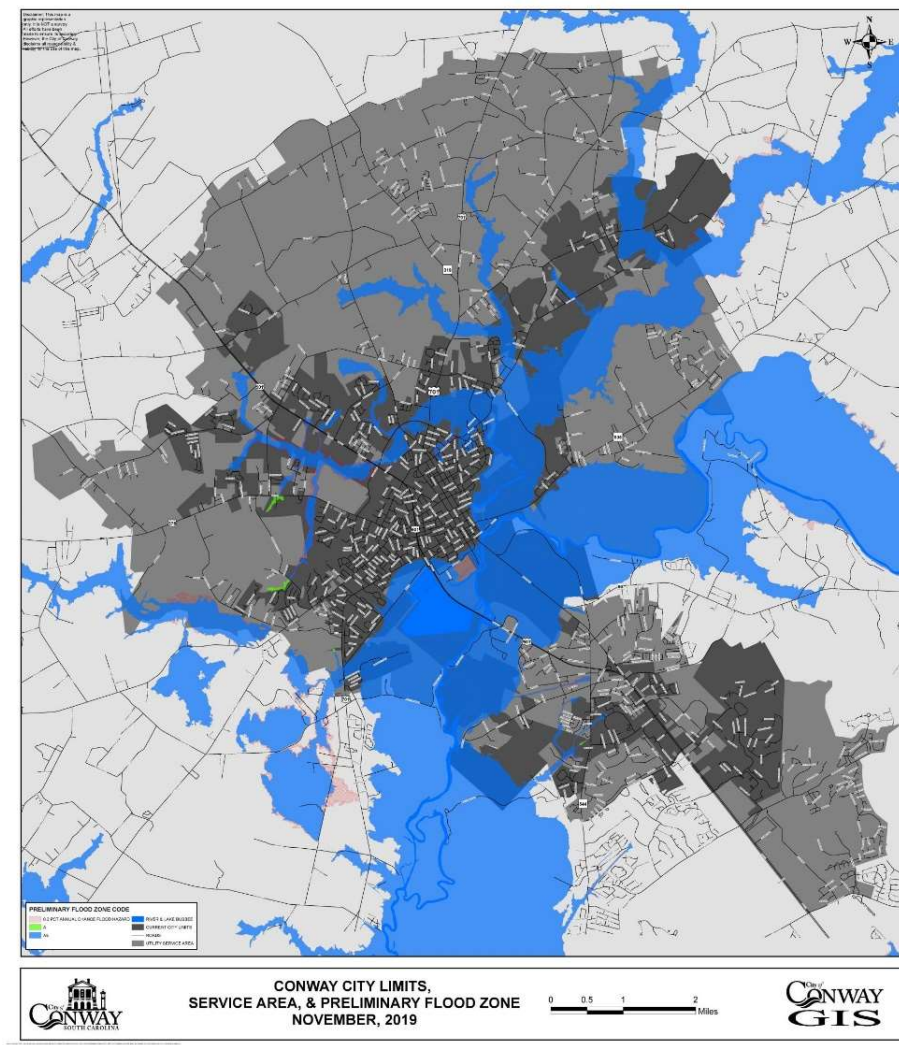
The National Flood Insurance Program (NFIP) requires participating counties and towns of which Conway is one, to issue permits for all development in the 100-year floodplain. Development is broadly defined to include any man made change to the land including

grading, filling, dredging, extraction, storage, subdivision of land, and the construction or improvement of structures. If state and federal permits are required, development may not begin until all necessary permits are issued. Proposed development must not increase flooding or create a dangerous situation during flooding, especially for adjacent or nearby property owners. Structures must be built to minimize damage during flooding (*SCDNR, Regulations for Floodplain Management (Envision 2025)*).

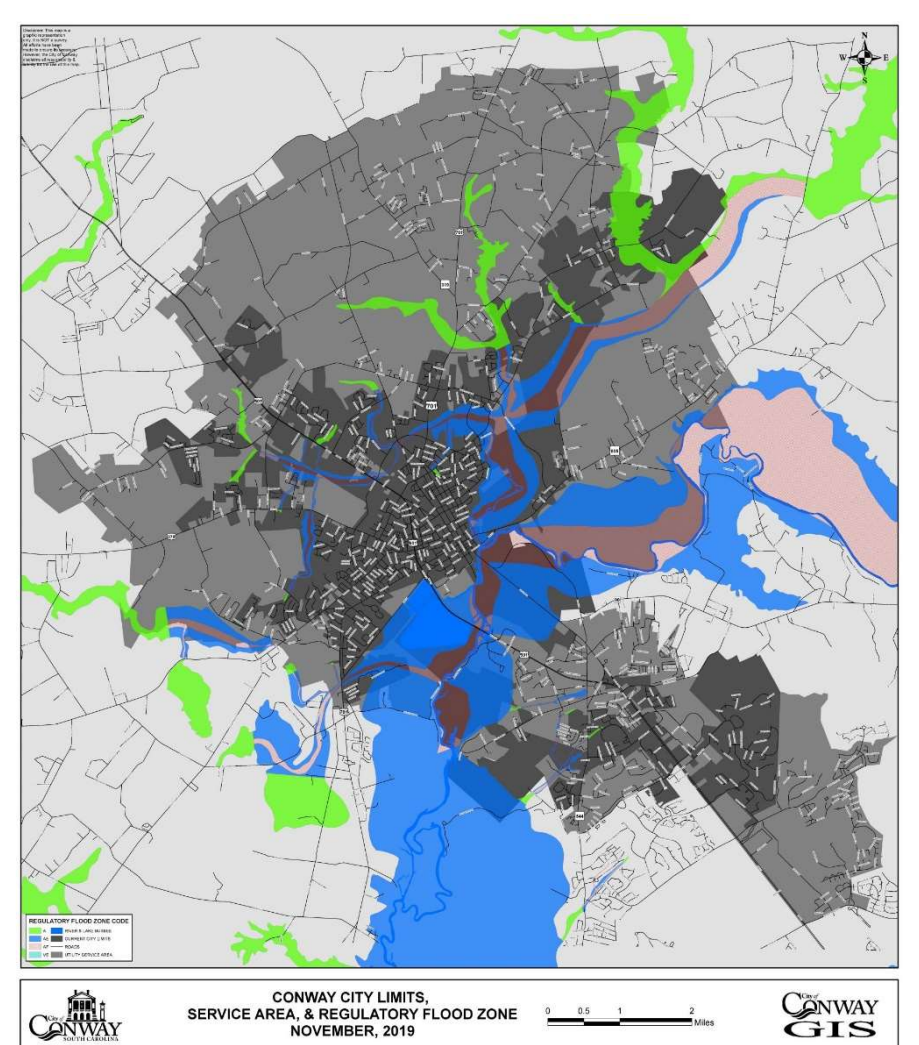
In September 2015, FEMA distributed a Flood Insurance Study (45051CV003B). In 2016, in the wake of catastrophic flooding, the report revised and updated information on the existence and severity of flood hazards for the area. The study developed flood hazard data that will be used to establish actuarial flood insurance rates and to assist communities in efforts to implement sound floodplain management. Proposed revised floodplain maps were released and owners of property in the floodplain areas were notified through Horry County of their continued or newly identified status.

The City of Conway's *Unified Development Ordinance (UDO)* and Code of Ordinances were amended to adopt all flood maps, including Hurricane Matthew levels (**MAP NR-9; MAP NR-10** (next page)). The Ordinance states that "such building area(s) shall lie at or be elevated to at least 2-feet above the 100-year flood elevation as provided for the Flood Damage Prevention Ordinance".

Map NR-9: Conway City Limits, Service Area & Preliminary Flood Zone (November 2019)



Map NR-10: Conway City Limits, Service Area & Regulatory Flood Zone (November 2019)



PRELIMINARY FLOOD ZONE CODE

- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- A
- AE
- RIVER & LAKE BUSBEE
- CURRENT CITY LIMITS
- ROADS
- UTILITY SERVICE AREA

REGULATORY FLOOD ZONE CODE

- A
- AE
- AF
- VE
- RIVER & LAKE BUSBEE
- CURRENT CITY LIMITS
- ROADS
- UTILITY SERVICE AREA

Hurricane Joaquin

In October 2015, the City of Conway sustained catastrophic flooding due to rainfall associated with Hurricane Joaquin. The Waccamaw River crested at 16.2-feet; 7.2-ft above its normal level of 9-ft.

Most affected homes were along Crab Tree Swamp and Grier Swamp, however, there were sporadic homes affected by the volume of rain throughout the City. The Riverwalk area flooded, including the Conway Marina, Riverfront Park and the Conway Tennis Center.

Both residential and commercial properties were affected, however, it is believed not all those affected by the flooding were reported.

Damage assessments showed only 11 properties were reported as damaged and assessed to have flood-related damages, with the most severe at only 25%.

Hurricane Matthew

In October 2016, the City again sustained catastrophic flooding from Hurricane Matthew. Hurricane Matthew triggered the evacuation of the South Carolina coastline. Matthew downed thousands of trees along the coast and inland. Heavy rains forced the rivers in eastern South Carolina above major flood stage. The flooding of the Waccamaw crested at 17.9' breaking the record of 17.8' in 1928 (dnr.sc.gov/Matthew2016).

According to the National Weather Service, the Conway area had 12.17 inches of rainfall during the storm. Rivers rose to all-time record levels in many locations with severe and life-threatening impacts occurring. Much of the flooding happened well outside the typical river floodplains into areas residents did not believe could flood. The Waccamaw River near Conway crested at its highest level in history. Flooding closed 170 roads including U.S. Highway 501 (*National Weather Service (NWS)*).

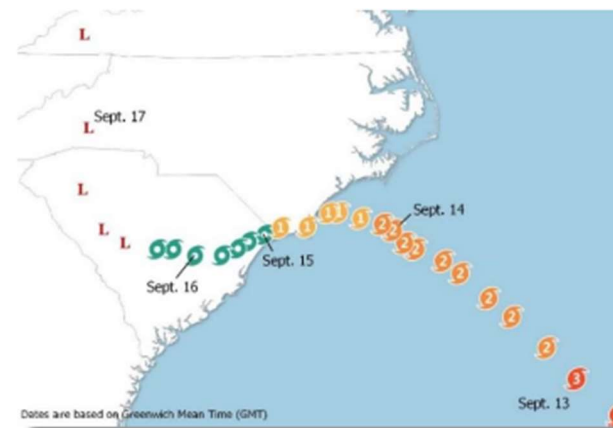
City personnel visited 112 locations and performed 12 water assisted evacuations. The remainder were either vacant properties or the residents opted to stay (*City of Conway*).

The City of Conway had a total of 60 residences and businesses apply for the FEMA Flood Buyout program. The city divided these properties into three tiers based on the severity of their flooding, with tier one being the most severely affected. A consultant was hired by the city to work with property owners individually to complete the transactions (*City of Conway*). To date, 27 homes have been purchased and demolished. Studies are currently underway to research the potential uses for these properties.

Hurricane Florence

Hurricane Florence made its official landfall on September 14th, 2018 as a Category 1 storm, and although the landfall occurred in North Carolina, the eye of the hurricane passed over the city, and the slow-moving storm's unique track (*Image NR-4*) brought unprecedented rainfall to South Carolina, causing extreme riverine flooding that resulted in devastating impacts (*S.C. State Climatology Office*).

Image NR-4: H. Florence unique track

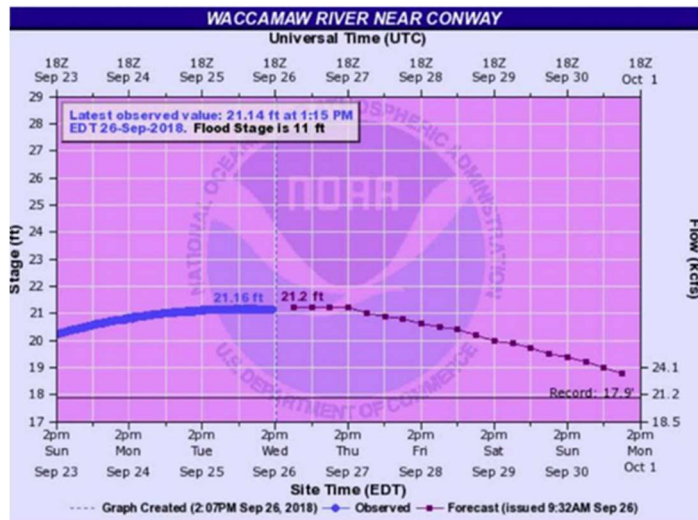


Source: SCDNR

Many areas of South Carolina experienced four consecutive days of heavy rainfall due to the slow-moving hurricane. The most widespread heavy rain fell in the Pee Dee River Basin. The heaviest rainfall measured in SC from H. Florence was 23.63" in Horry County (Loris, SC), which exceeded the 1,000-year return interval mark for 4-day rainfall accumulation. This is the highest rainfall total in SC, per the NOAA Weather Prediction Center, beating the previous record of 17.45" measured at the National Weather Service station near Jocassee from Tropical Storm Beryl in 1994.

The Waccamaw River crested at approx. 21.2-feet in Conway on September 26, 2018; two weeks after Hurricane Florence made landfall.

Image NR-5: Waccamaw River Crest Level in Conway



Source: Nat'l Weather Service (NWS)

388 homes were damaged as a result of Hurricane Florence in the City of Conway; 163 of which were in the FEMA-defined 100-year flood zone and 255 outside the flood zone.

City Public Safety Personnel visited approx. 84 locations and assisted in 27 evacuations. The remainder of locations either opted to stay, were vacant, or self-evacuated (*City of Conway*).

The flooding from Hurricane Florence caused extreme traffic delays due to multiple road closures across the City and County. Additionally, a temporary flood barrier was installed on Hwy 501 at Lake Busbee, the only remaining way across the Waccamaw River from Conway, that limited traffic to one lane each way, making it nearly impossible for residents to access businesses and jobs.

Historic Flooding Following Hurricane Florence

Image NR- 6: Long Ave Ext. flooding after H. Florence



Image NR-7 (below): Aerial view of flooding of downtown Conway

Source: Washington Post

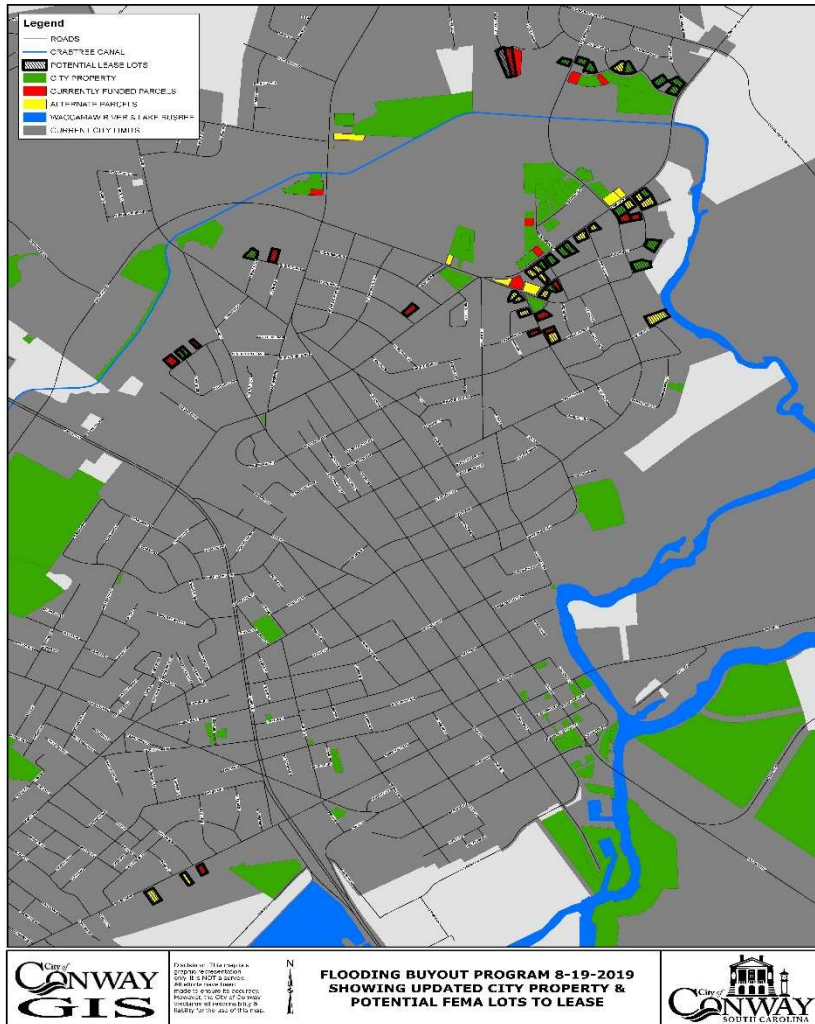


Source: Myrtle Beach Online

FEMA Buyout Program

The City acquires parcels of impacted residential and commercial floodplain property through the Federal Emergency Management (FEMA) Hazard Mitigation Grant Program to remove structures from flood prone areas. These parcels will be used for flood protection, ecological protection and potential community benefits.

Map NR-11: Updated City Property & Potential FEMA lots to lease (as of 8-19-2019)

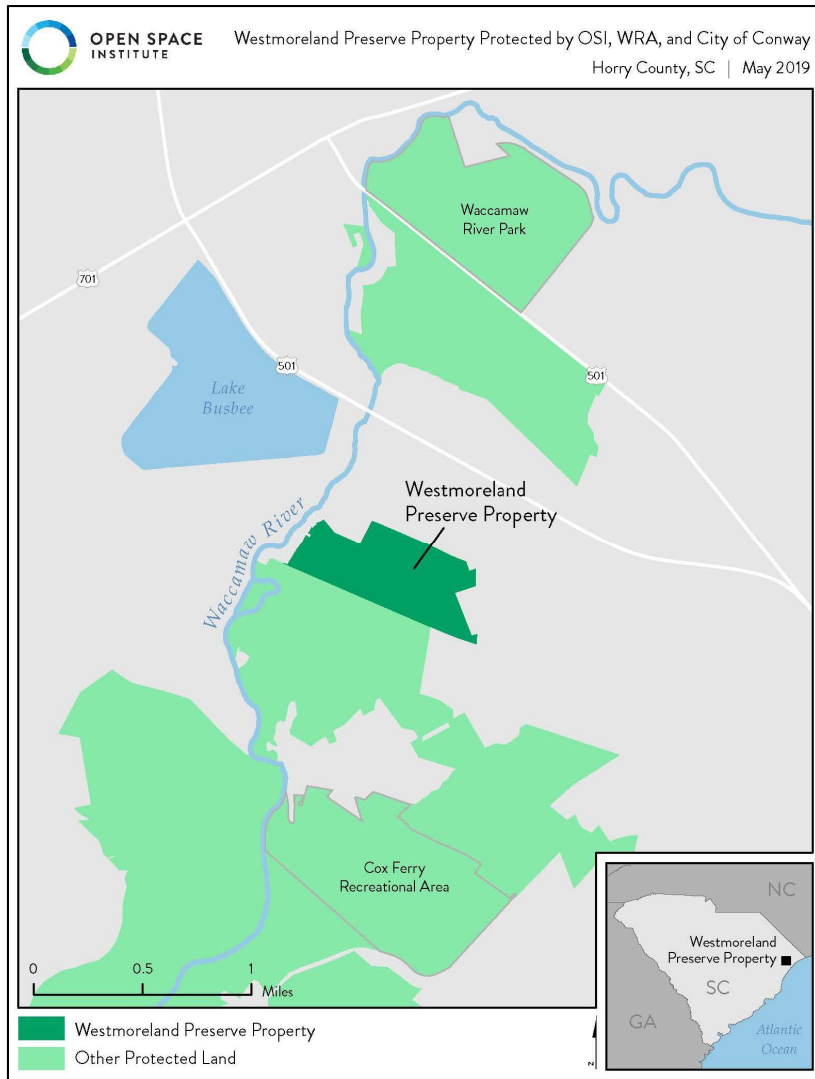


The Open Space Institute (OSI)

Since 1974, OSI has emphasized the importance of supporting conservation on a permanent, landscape scale (*Open Space Institute (OSI)*). They have recently used their transactional expertise to save significant and complex large-scale tracts of land in South Carolina, Florida, and New Jersey through direct acquisitions (*OSI*). OSI works with government agencies, landowners, and local trusts to acquire land to protect diverse landscapes; preserve habitat for rare or endangered species; ensure water quality; facilitate wildlife adaptation to climate change; and enhance recreational areas (*OSI*).

In 2016, OSI joined the Upper Waccamaw Task Force, conservation organizations, and local government looking for a natural solution to the flooding problem (*OSI*). The Task Force identified conservation as one of the most effective long-term solutions to aid in the absorption of water during and after extreme rain events. Once the Task Force identified a floodplain forest along a section of the Waccamaw River and in the Conway's City limits, OSI helped locate a 152-acre parcel critical to providing flood relief to Conway (*OSI*). Parcels like this can provide natural buffers against catastrophic flooding when conserved, as they can hold millions of gallons of water that would otherwise inundate local homes and streets (*OSI*). Forested wetland properties act as sponges and can provide breaking action on fast-moving floodwaters, which in turn slow their speed and reduce erosion (*OSI*). In conjunction with sustainable city planning and updated building codes, land protection will form a critical part of the solution to safeguarding Conway (*OSI*).

The acquisition of the 152-acre tract, known as the "Westmoreland Preserve", is key to furthering the Conway Conservation Corridor, a network of conserved lands intended to mitigate flooding while providing a pedestrian connection between downtown Conway and Coastal Carolina University (*City of Conway*). **Map NR-12** (next page) shows the Westmoreland Preserve Property.



Source: Open Space Institute (OSI)

The City of Conway continues to acquire property for conservation. Currently, the City has 3,358 acres in conservation property; approx. 22% of the City. A map of these conservation properties can be seen in the Land Use Element of the Comprehensive Plan.

Flood Strategy

There are four components to the City's flood strategy:

1. Retreat
2. Resiliency
3. Storage
4. Infrastructure

RETREAT POLICY. Recently, SCEMD informed the City they could proceed with the next two groups of buyouts, which will allow the City to buy up to 28 more properties. If the City purchases all 28 properties, that would take the total number of properties bought to 56.

RESILIENCY STRATEGY. The City has a lot of public infrastructure in the flood plain. All of the City's Riverfront has a chance of flooding, but it is also the most scenic part of the City and what the City is known for. The goal is to make it publicly accessible 99% of the time that the City is not flooding. As the City rebuilds in areas where flooding is expected, a plan is needed to build better and make those areas flood adaptable.

CAPACITY STRATEGY. Increasing the amount of storage capacity of stormwater is always an utmost concern. However, adding storage capacity after subdivisions are built is nearly impossible. Crabtree Canal was an Army Corps project and is maintained by Horry County. The City's ability to add capacity to Crabtree is very limited because of jurisdictional concerns. There are also a lot of environmentally sensitive reasons that the canal cannot be greatly altered. However, assuring that new developments install the correct amount of stormwater infrastructure to hold more water post development than predevelopment is a mandatory requirement. Further, given the

amount of land that the City has acquired in the FEMA buyouts, the City may be able to add capacity to the Sherwood community to add additional storage areas and slow the water from reaching Crabtree. This will both clean the water and reduce the amount of water that reaches Crabtree. While this option is costly, it may be grant fundable.

INFRASTRUCTURE STRATEGY. The costliest option is improving the City's infrastructure; namely roads and bridges. All roads that cross Crabtree, Kingston Lake and the Waccamaw River, all SCDOT roads, are also dams. They restrict the amount of water that can pass through or under and hold water on the upstream side. These dams lead to flash flooding and to some extent riverine flooding. SCDOT does not build roads or bridges to anything more than a 25-year flood event, far below the need shown in recent flood years. Hwy 905 and Hwy 501 Bypass both have safety concerns during flood events, with 905 washing out several times and 501 Bypass having structural concerns. However, this strategy is beyond the funding ability of the City and must be addressed by SCDOT and the Federal Government.

Community Rating System (CRS)

The CRS is part of the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) – an incentive program that encourages flood-prone communities to reduce their vulnerability to flood hazards. FEMA's Community Rating System consists of 19 activities that are meant to improve a community's overall resilience to flooding. The activities are divided into four categories or series: public information, mapping and regulation, flood damage reduction, and warning and response. Communities can earn points for completing and documenting these activities, and these points translate to discounts on flood insurance premiums for residents of the community. For every 500 points a community earns, it moves up one class level in the CRS system and gains an additional 5% discount on flood insurance premiums. Communities are ranked based on the

number of points they earn, from Class 9 (lowest) to Class 1 (highest). Communities with a higher class rank have earned more points by completing more flood prevention activities, so they receive greater flood insurance discounts. In order to apply to the CRS, the application must show that Conway would be able to earn at least 500 points and meet all Class 9 prerequisites.

The City of Conway engaged with a group of students at The University of North Carolina at Chapel Hill to complete an analysis and provide recommendations for Conway to apply for the Community Rating System (CRS). The students conducted research, reviewed CRS activities in other communities, visited Conway and spoke with local officials, and gathered insight from representatives of other CRS communities in order to develop a set of recommendations for Conway. The students found that Conway has already completed multiple activities that would earn CRS credit, and listed these activities, along with the necessary steps to document and earn credit(s), that could put Conway as a Class 9 community. They then created primary and secondary recommendations that they felt would help Conway get additional points and potentially move up another class. Conway has identified the CRS as a main goal within this element of the Comprehensive Plan, as a strategy in management of regulatory flood plains and special flood hazard areas.

The Nature Conservancy

The Nature Conservancy (TNC) works with landowners, communities, cooperatives and businesses to establish local groups that can protect land and water. Some of the main tools used to achieve these goals include land trusts, conservation easements, private reserves and incentives (*The Nature Conservancy*).

The main priorities of TNC include addressing climate change, protecting land and water, providing food and water sustainability and building healthy cities. In the United States, TNC uses land acquisition as

a principal tool of its conservation efforts. In the US, the Conservancy helps to protect 15 million acres. Worldwide, TNC has helped to protect more than 119 million acres of land, countless miles of rivers and streams and the world's largest oceans (TNC).

Image NR-8: Ex. of Nature Based Solutions & Natural Infrastructure



ABOVE: Types of nature-based solutions and natural infrastructure © NOAA

Source: The Nature Conservancy (TNC)

North Coast Resilience Project (NCRP)

Since 2015, Conway and other municipalities within Horry County, collectively referred to as the *North Coast*, have witnessed flooding impacts of recent storms. Flooding has become more apparent and persistent. During storm events, the rivers and its tributaries swell over their banks, closing roads and flooding neighborhoods (The Nature Conservancy). 20% of South Carolina residents live in areas at risk for 100-year floods. Flooding is increasingly becoming so severe that even those living outside zones are impacted. The Federal Emergency Management Agency (FEMA) received nearly 1,000 flood claims in 2015 from Horry and Georgetown Counties. More than 50% of the

homes damaged in the City of Conway in 2018 following Hurricane Florence were outside of a flood zone.

In 2016, TNC launched the North Coast Resilience Project (NCRP) in South Carolina, North Carolina, Georgia and Florida to educate communities on planning tools and support the development of community resilience plans. The goal of the NCRP is to understand and address local flood risks in Horry and Georgetown Counties, which is being done through a stakeholder-driven process that focuses on nature-based solutions (TNC).

TNC used past storm flooding data to create GIS models for North Coast floodplains in 2017, 2035 and 2060. These maps show predicted and projected flood risk, with updated information for current land cover, including new buildings and existing open space. TNC led focus groups in February and July 2018 to gain local stakeholder knowledge that would guide the identification of problematic areas as well as possible nature-based solutions (Image NR-8 – left) to solve them. Data collected showed three types of unique and persistent flooding on the North Coast:

- Coastal flooding from high tides and rising seas
- Riverine flooding from swollen rivers overflowing their banks during and after storms
- Stormwater flooding in low-lying and heavily paved areas

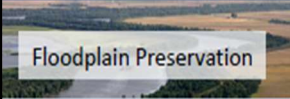
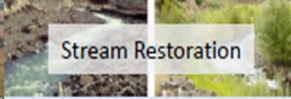
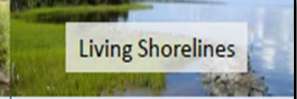
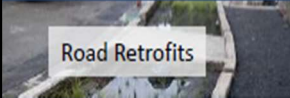

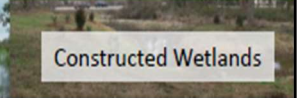



Nature-Based solutions incorporate both the natural environment and engineered systems that mimic or work in concert with natural systems to provide flood, fire and drought risk reduction, as well as cleaner water and air (TNC). Through the use of the focus groups, the following nature-based solutions were identified:

- Land conservation
- Stream and floodplain restoration
- Reforestation of repetitive flooding buyouts
- Low-impact development retrofits
- Living shoreline installations

TNC and its partners will implement an on-the-ground project in the North Coast that protects, restores, and improves management of lower order streams connected to the Waccamaw River. For any top priority projects that cannot be funded under the North Coast Resilience effort, a list of shovel ready projects will be suggested and ready to implement when and if future funding is available (TNC).

Image NR-9 (right) provides examples of approaches to maintaining ecosystem services for flood mitigation.

Image NR-9: Ex. of approaches to maintaining and restoring ecosystem services for flood mitigation

 <p>Floodplain Preservation</p> <p>Reduce the risk of flooding, prevent or reduce risk to human life and property, and maintain the functions and values of floodplains, such as allowing for the storage and conveyance of stream flows through existing and natural flood conveyance systems.</p>	 <p>Stream Restoration</p> <p>A set of activities that help improve the environmental health of a river or stream. These activities aim to restore the natural state and functioning of the river system in support of biodiversity, recreation, flood management and landscape development.</p>	 <p>Living Shorelines</p> <p>An erosion control strategy that incorporates native wetland vegetation either alone, or in combination with structural elements like natural fiber logs, bagged oyster shell, rock, or wooden sills parallel to shore to provide an initial wave break.</p>
 <p>Road Retrofits</p> <p>Retrofitting roads and the water conveyance structures, such as culverts, ditches, and drains, that are undersized to adequately convey water in developed areas.</p> <p>Culvert and bridge replacements in emergencies, rather than proactive measures, increases replacement cost by 4-140 times.</p>	 <p>Wetland Restoration</p> <p>The manipulation of a former or degraded wetland's physical, chemical, or biological characteristics to return its natural structure and function. For example, restoring the bottom elevation in a wetland can reestablish the hydrological regime, natural disturbance cycles and nutrient fluxes.</p>	 <p>Constructed Wetlands</p> <p>An artificial wetland to treat municipal or industrial wastewater or stormwater runoff. It may also be designed for land reclamation after mining, or as a mitigation step for natural areas lost to land development.</p>
 <p>Beneficial Use of Sediment</p> <p>Using sediment dredged from waterways in an environmentally beneficial way rather than confining in a disposal site. Examples include thin layer placement to enhance marsh growth or placement of sand to enhance important sand shoals or barrier islands.</p>	 <p>Property Buyout & Restoration</p> <p>The acquisition of flood-prone properties using a combination of federal, state, or local funds. Once the property has been purchased, buildings are removed, and the land can be restored to a natural state with the potential for habitat restoration.</p>	 <p>Low Impact Development</p> <p>An integrated, comprehensive approach to land development or redevelopment that works with nature to manage stormwater as close to its source as possible. LID practices mimic the natural hydrologic regime through strategically integrated stormwater controls distributed throughout the landscape.</p>

Source: TNC

LAND RESOURCES

Air Quality

The S.C. Department of Health and Environment Control (SCDHEC) is responsible for air quality monitoring. Air monitors are operated throughout the state to measure the concentrations of pollutants in the air. **Table NR-3** (below) shows the Air Quality Index for Horry County from 2010-2017.

Table NR-3: Air Quality Index for Horry County

Year	No. of days monitored	Good air quality days (%)	Moderate Air Quality Days (%)	Unhealthy Air Quality Days for Sensitive Groups	Unhealthy Air Quality Days (%)	Max	Median
2019*	206	150 (73%)	56	0	0	97	44
2018	289	271 (94%)	18	0	----	87	36
2017	354	350 (99%)	4	0	0	64	32
2016	136	136 (100%)	0	0	0	39	26
2011	266	232 (87%)	34 (13%)	0	0	90	40
2010	251	212 (85%)	38 (15%)	1	0	101	41
2009	147	143 (97%)	4 (3%)	0	0	55	22

*Annual statistics for 2019 are not final until May 1, 2020

Source: U.S. EPA AIRDATA: Data from this source was not available for Horry County for years 2012, 2013, 2014, and 2015.

Source: Homefacts.com; Horry County Air Quality

The Clean Air Act and the United States Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment (H.C. *IMAGINE 2040*). Horry County shows good quality air, although the number of days monitored vary through the years reported, the air quality percentages of good quality air are relatively similar throughout

2010-2017. From 2009 through 2018, the air quality reports show good air quality and also remain very similar from year to year.

According to Horry County's *IMAGINE 2040*, air pollutants in Horry County is divided into several different types of sources. These include the following:

- Point sources – large, fixed sources, such as industrial sites, which emit pollutants from activities onsite.
- Area sources – fixed sources, but generally small and widespread, such as dry cleaners and gasoline refueling stations.
- Mobile sources
 - On-road sources – refer to highway vehicles
 - Non-road sources – vehicles or equipment (i.e. construction equipment, recreational boats, etc.).

Industrial sites emit pollution from activities on the site; however, Conway's Heavy Industrial Zoning District does not currently house any sites that would be polluting the air. The Heavy Industrial (HI) Zoning District is a potential location for businesses that could emit pollutants into the air; however, the City of Conway has design standards for the Heavy Industrial (HI) zoning district that must be adhered to, which are outlined in *Article 6, Section 6.3.9* of the City of Conway *Unified Development Ordinance (UDO)*.

In 2016, the Adolphus Grainger Steam Plant was dismantled after several years of being inactive, thereby ending any pollutants being dispersed into the air from that facility.

Other sources of air pollution come from on-road sources such as vehicles or construction equipment and recreational boats. In Horry County, it is most likely that the largest contributor of ozone emissions is from on-road vehicles. These emissions can be reduced by improving traffic flow, reducing idling times, and providing alternative transportation options.

Plant and Animal Habitats

As land use is converted from rural to urban uses and the population of Conway increases, new challenges arise for fish and wildlife species. The SCDNR continues to support a large number of conservation initiatives on public and private lands, including habitat protection, technical guidance and cost sharing, and education. In 2005, the SCDNR developed the South Carolina Wildlife Conservation Strategy. When updated in 2015, it was renamed the State Wildlife Action Plan or SWAP. SWAP also contains the eight required elements to protect and improve the state's wildlife populations, which include the following:

1. Distribution and abundance of species
2. Location and relative condition of key habitats
3. Problems that affect species
4. Conservation actions described
5. Plans for monitoring and adaptive management
6. Review and revise plan
7. Coordinate with federal, state, and local agencies as well as Indian tribes
8. Public participation

The SWAP is organized to make readers aware of the need for a strategy then to discover how the actual action plan was developed and presented. A link to the entire SWAP can be found below:

<http://dnr.sc.gov/swap/main/2015StateWildlifeActionPlan-chaptersonly.pdf>

Climate

While climate may not be considered a natural resource, it obviously has an effect on the makeup and condition on all natural resources. Conway's climate is considered as temperate with the exception of high temperatures and humidity in the summer months. Rainfall in Conway is moderate, with an average annual total of 52.04 inches (*U.S. Climate Data*). Almost half of the annual rainfall occurs from June to September. The prevailing wind direction is north. During the winter

months, Conway and South Carolina are typically under a continental air mass that is cold and dry, while during the summer, the Bermuda high pressure cell in the Atlantic Ocean drives much of the weather. Heat and humidity prevail when clockwise circulation around the Bermuda High brings a southerly flow of air from the Gulf of Mexico (*Shaping the Future, South Carolina State Climatology Office*). The average high temperature for Conway, SC is 75.3 degrees (F) and the average low temperature is 53.3 degrees (F) (*U.S. Climate Data*).

Table NR-4 (below) shows monthly temperatures, rainfall and snowfall (averages).

Table NR-4: Period of Record Climate Summary

	Avg. Max Temperature (F)	Avg. Min. Temperature (F)	Avg. Total Precipitation (in.)	Avg. Total Snowfall (in.)	Avg. Snow Depth (in.)
January	57	34	4.13	0	NA
February	61	37	3.43	0	NA
March	68	44	3.94	0	NA
April	76	51	3.03	0	NA
May	83	60	3.19	0	NA
June	88	69	4.65	0	NA
July	91	72	6.81	0	NA
August	89	71	7.36	0	NA
September	85	65	5.51	0	NA
October	77	54	3.54	0	NA
November	69	45	2.99	0	NA
December	60	37	3.46	1	NA

Source: U.S. Climate Data (2018 data)

The Waccamaw River and Wildlife

Waccamaw River is home to a diverse and rare collection of flora and fauna; and most notably, the American Black Bear. Several rare, threatened or endangered species are found on the Waccamaw, including *Fimbristylis perpusilla* (Dwarf fimbry), *Hemicarpha micrantha* (Common hemicapha), *Echinodorus tenellus* var. *parvulus* (Little burhead), *Sabatia kennedyana* (Plymouth gentian) and *Coreopsis rosea* (Pink tickseed). Carnivorous plants, like the Venus flytrap, sundews and pitcher plants can be found in savannah-like areas, including Green Swamp and the edges of Carolina Bays (*Winyah Rivers Alliance*).

The Waccamaw River and People

The River is a major part of Conway's history, due to its early dependence on river commerce (*Winyah Rivers Alliance*). The Waccamaw River supports recreational fishing and other water sports, provides drinking water, is a venue for tourism and camping, and enhances the lives of those who touch it through its beauty and serenity.

Waccamaw National Wildlife Refuge

The Waccamaw National Wildlife Refuge was established in 1997 for the purpose of protecting and managing diverse habitat components within coastal river ecosystems for the benefit of endangered and threatened species, freshwater and anadromous fish, migratory birds, and forest wildlife, including a variety of plants and animals with bottomland hardwood habitats, and to provide a variety of wildlife-dependent recreational activities including hunting, fishing, wildlife observation, photography and environmental education (*U.S. Fish & Wildlife Service*). The boundaries of the refuge include 29,000 acres, with 6,166 acres of uplands, located primarily on Sandy Island and the remaining balance made primarily of jurisdictional wetlands (*USFWS*).

Other plant and animal habitats located outside the City limits include: Playcard Environmental Education Center, the Lewis Ocean Bay

Heritage Preserve, the Little Pee Dee Heritage Preserve, and the Cartwheel Bay Heritage Preserve.

Image NR-10: Swallow-tailed kites



Source: U.S. Fish & Wildlife website

Bird Sanctuary

The City of Conway Code of Ordinances, Section 6-4-5, states that the City is a designated bird sanctuary. It shall be unlawful to trap, hunt, shoot or molest in any manner any wild fowl or bird or to rob bird nests or wild fowl nests, except as provided for in the *Unified Development Ordinance (UDO)*, Section 5.1.15; provided, that if starlings or similar birds are found to be congregated in such numbers in a particular locality that they constitute a menace or nuisance to health or property, in the opinion of the proper authorities of the City, then City authorities shall meet with representatives of the Audubon Society, Bird Club, Garden Club or Humane Society or as many of these clubs as are found to exist in the City, after having been given at least three (3) days' notice of the time and place of meeting to the representatives of the clubs. If, as a result of the meeting, no satisfactory alternative is found to abate the nuisance, then the birds may be destroyed in such numbers and in a manner as is deemed advisable by the City under the supervision of the Chief of Police.

The City could improve tree and landscaping ordinances as well as encourage conservation easements and low-impact development to improve and preserve bird habitats. There is also potential for public education around improving City lands and home landscapes to benefit habitats.

Threatened and Endangered Species and Communities known to occur in Horry County, SC (September 2019)

Table NR-4: List of Threatened and Endangered Species in Horry County, SC

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibians			None Found	
Birds	American wood stork (T)	<i>Mycteria americana</i>	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	<i>Haliaeetus leucocephalus</i>	October 1-May 15	Nesting season
	Black-capped petrel (ARS)	<i>Pterodroma hasitata</i>	April-October	Offshore water primarily
	Piping plover (T, CH)	<i>Charadrius melodus</i>	July 15-May 1	Migration and wintering
	Red-cockaded woodpecker (E)	<i>Picoides borealis</i>	March 1-July 31	Nesting season
	Red knot (T)	<i>Calidris canutus rufa</i>	August 1-May 31	Migration and wintering
	Saltmarsh sparrow (ARS)	<i>Ammospiza caudacuta</i>	Fall/winter	Fall/winter surveys
Crustaceans			None Found	
Fishes	Atlantic sturgeon* (E)	<i>Acipenser oxyrinchus</i> *	February 1-April 30	Spawning migration
	Robust redbone (ARS)	<i>Moxostoma robustum</i>	Late April-early May	Temperature dependent: 16-24°C
	Shortnose sturgeon* (E)	<i>Acipenser brevirostrum</i> *	February 1-April 30	Spawning migration
Insects	Monarch butterfly (ARS)	<i>Danaus plexippus</i>	August-December	Overwinter population departs: March-April
Mammals	Finback whale* (E)	<i>Balaenoptera physalus</i> *	November 1-April 30	Off the coast
	Humpback whale* (E)	<i>Megaptera novaengliae</i>	January 1-March 31	Migration off the coast
	Northern long-eared bat (T)	<i>Myotis septentrionalis</i>	Year round	Winter surveys not as successful
	Right whale* (E)	<i>Balaena glacialis</i>	November 1-April 30	Off the coast
	Sei whale* (E)	<i>Balaenoptera borealis</i>		
	Sperm whale* (E)	<i>Physeter macrocephalus</i>		
	Tri-colored bat (ARS)	<i>Perimyotis subflavus</i>	Year round	Found in mines and caves in the winter
	West Indian manatee (T)	<i>Trichechus manatus</i>	May 1-November 15	In coastal waters
Mollusks			None Found	

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Plants	American chaffseed (E)	<i>Schwalbea americana</i>	May-August	1-2 months after a fire
	Carolina-birds-in-a-nest (ARS)	<i>Macbridea caroliniana</i>	July-November	
	Ciliate-leaf tickseed (ARS)	<i>Coreopsis integrifolia</i>	August-November	
	Godfrey's stitchwort (ARS)	<i>Minuartia godfreyi</i>	April-June	
	Harper's fimbriistylis (ARS)	<i>Fimbristylis perpusilla</i>	July-September	
	Seabeach amaranth (T)	<i>Amaranthus pumilus</i>	July-October	
	Venus flytrap (ARS*)	<i>Dionaea muscipula</i>	May-June	
	Wire-leaved dropseed (ARS)	<i>Sporobolus teretifolius</i>	August-September	Following fire
	Yellow pond lily (ARS)	<i>Nuphar lutea ssp. sagittifolia</i>	April-October	
Reptiles	Green sea turtle** (T)	<i>Chelonia mydas</i> **	May 1-October 31	Nesting and hatching
	Kemp's ridley sea turtle** (E)	<i>Lepidochelys kempi</i> **	May 1-October 31	In coastal waters
	Leatherback sea turtle** (E)	<i>Dermochelys coriacea</i> **	May 1-October 31	Nesting and hatching
	Loggerhead sea turtle** (T, CH)	<i>Caretta caretta</i> **	May 1-October 31	Nesting and hatching
	Southern hognose snake (ARS)	<i>Heterodon simus</i>	Most of the year	
	Spotted turtle (ARS)	<i>Clemmys guttata</i>	February-early April	

*	Contact National Marine Fisheries Service (NMFS) for more information on this species.
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species.
ARS	Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
ARS*	Species that are either former Candidate Species or are emerging conservation priority species.
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species.
CH	Critical Habitat
E	Federally Endangered
P or P-CH	Proposed for listing or critical habitat in the Federal Register
S/A	Federally protected due to similarity of appearance to a listed species
T	Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

Source: U.S. Fish & Wildlife Service

Agriculture

While the City of Conway has no working farms, Horry County has seen an increase of crop and livestock sales despite the loss of farmland. As of 2017, there were 767 farms in Horry County (177,659 acres) (*Horry County IMAGINE 2040*). Historically, tobacco served as the largest revenue generating crop in the county, and while Horry County remains the number one producer of tobacco in the state (*USDA, 2017*), many farmers are transitioning into other crops, such as peanuts and sweet potatoes (*Horry County IMAGINE 2040*). The most abundantly grown crops in Horry County include soybeans, corn and wheat for grain and foraging, and peanuts. Cotton production and yield also increased from 2007 to 2012 (*USDA, 2012*).

Image NR-11: Products from the Farmers Markets



Source: Waccamaw Market Cooperative

Prime agricultural soils cover 60% of the Horry County's total land area, and while much of the county is viable for crop production, only 12.8% is currently in use (*Horry County IMAGINE 2040*). Horry County lags behind the state and region in fruit, vegetables, melons, berries and nuts. However, given the number of area farmers markets, fruit and vegetable farming could be an opportunity in the county.

As farmers age and farming becomes less economically viable for them, many are opting to sell their land for development. When this happens, social benefits such as flood control, groundwater recharge, and wildlife habitat are replaced by the social costs of infrastructure such as schools, police and emergency services. Protecting farmland carries with it the safeguarding of our agricultural heritage, economic resources, and numerous ecological benefits. Conservation easements for farmlands may be a way to protect these lands through partnerships, transferable development rights (TDR's), the City, County and Federal agencies.

Farmers Markets

Farmers Markets offer fresh fruits and vegetables grown near you and picked at the peak of growing seasons (USDA). Farmers markets may vary in size and reflect a region's agriculture and seasons (Farmers Market Coalition). The number of farmers markets in the US has grown rapidly in recent year, from just under 2,000 in 1994 to more than 8,600 markets that are currently registered in the USDA (Farmers Market Coalition).

Image NR-12: Products being sold at a Farmers Market



Source: Farmers Market Coalition

Waccamaw Market Cooperative (WMC) is responsible for coordinating and managing community based farmer's markets throughout Horry and Georgetown Counties. Their structured market network ensures that communities in the Waccamaw Region benefit from access to

fresh fruits and vegetables that farmers markets offer (Waccamaw Market Cooperative).

The WMC has hosted a farmers' market in downtown Conway since 2008. They are typically held on Saturdays from 8 am to 1 pm, during certain times of the year.

Clemson Extension

Clemson Extension and the College of Agriculture, Forestry and Life Sciences (CAFLS), founded by Thomas Green, focuses on improving the lives of South Carolinians through education and outreach in agriculture and natural sciences. Clemson Extension has offices in all 46 counties of the state, working to help and support South Carolina's \$42 billion agriculture and forestry industries; strengthen families and communities; improve stewardship of natural resources and the environment; strengthen connections between people and their food; and expose SC youth to opportunities in agriculture, science, technology, engineering and math (Clemson.edu). Resources are available in the following areas:

- 4-H Youth Development
- Agribusiness
- Agricultural Education
- Agronomy
- Food Systems and Safety
- Forestry and Wildlife
- Horticulture
- Livestock and Forages
- Rural Health and Nutrition
- Water Resources

Clemson Extension employs agents who work closely with state extension specialists and researchers located on campus at the various research and education centers located across the state. For additional information, please visit their website at www.clemson.edu/extension

Forest Land

Approximately 50% of Horry County's total land area is classified as forestland, with 30.7% considered forested wetlands and 18.7% as upland forests. Forestlands are valuable natural resources, and if properly managed, provide an excellent example of sustainable development practices. Some of the examples of the values forestlands provide are:

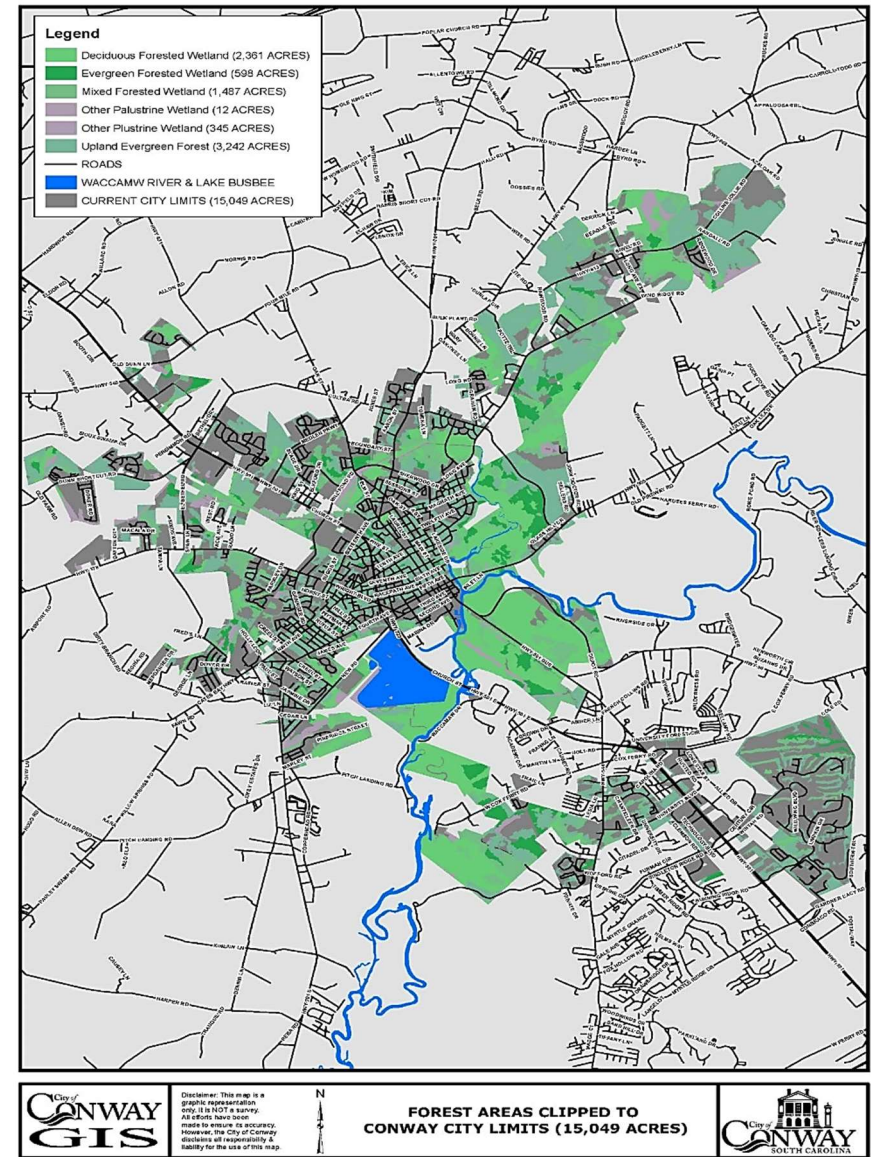
- Environment quality by controlling noise, abating winds, filtering air, preventing soil erosion, and protecting water quality.
- Habitat for a variety of wildlife, including both game and non-game species.
- Outdoor recreational opportunities and enjoyment of scenic beauty through camping, hiking, picnicking, hunting, and bird watching.
- Job creation and the production of more than 5,000 types of products.

(Horry County IMAGINE 2040)

In 2018, the City of Conway measured an estimated 8,045 acres of combined forest land, approx. 53% of the total acreage of the City (15,049 total acres). See **Map NR-13** (right). As Conway continues to grow, forest land acreage will undoubtedly diminish.

By comparison, in 2010, the State of South Carolina reported an estimated 13 million acres of forest land (67% of the state's total land area) in the state compared to 12.9 million acres in 2015, a decrease of 1.4%. The state's forestland acreage remains stable, averaging 12.6 million acres since 1968. 88% of the state's forests are privately owned, with 63% of those being family owned. Forest industries own 137,400 acres down 93% since 2001, and are continuing to decline. Public agencies manage 12% of the state's forests.

Map NR-13: Conway Forest Area(s) (as of 2018)



Forest products are exported to China, Mexico and Canada, representing a significant source of income for South Carolina with paper/paperboard and wood pulp being the majority of those products exported. South Carolina exports \$1.5 billion in forest products annually.

The winter of 2014's ice storm's damage assessment showed \$320M in timber damage. Hurricane Matthew in October 2016, caused over \$200M in timber damage statewide, but this loss represents less than 1% of the state's total timber value (*South Carolina Forestry Commission*).

Urban Forestry

Urban Forestry is defined as the art, science and technology of managing trees and natural systems in and around urban areas for the health and well-being of communities (*National League of Cities – Sustainable Cities Institute*).

The City of Conway, as of 2018, has been designated a Tree City for 33 consecutive years. The Tree City USA program is sponsored by The National Arbor Day Foundation in Cooperation with the U.S. Conference of Mayors, the National League of Cities, the National Association of State Foresters, the U.S. Forest Service and the S.C. Forestry Commission. In order to qualify for the Tree City designation, a community must meet four standards:

- Establish a tree commission or designate a municipal department responsible for public trees – in Conway the Community Appearance Board serves in this capacity
- Pass a municipal tree care ordinance (revised in 2007)
- Conduct a local Arbor Day observance and celebration
- Spend \$2 per capita annually on community forest management (City budgeted item)

Additionally, Conway's Unified Development Ordinance (UDO) and Tree Protection Ordinance requires developers in all zoning classifications to meet landscape requirements that includes tree

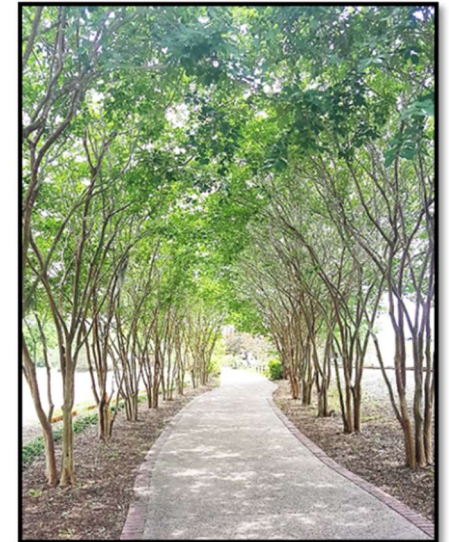
plantings, preservation of protected trees and dedication of open space which may include areas that have mature trees. The City also established a Beautification Department in 2001-2002 and has a full time arborist to assist in the maintenance and beautification efforts of the City for its parks and other properties.

Image NR-13: Tree City USA Designation Signage



Source: South Carolina Forestry Commission

Image NR-14: Urban Tree Canopy



Source: City of Conway

ARBOR DAY 2019

On October 5, 2019, the City gave away more than 900 trees to City residents, thanks to a grant from the Arbor Day Foundation's Community Tree Recovery Campaign – a partnership between the Arbor Day Foundation, FedEx and Verizon. The hope is that the trees planted will help with the City's flood mitigation efforts and replace those that were lost in the flood waters of Hurricane Florence. The variety of trees given to residents included Cypress, Oaks and Crape Myrtles (City of Conway).

Images NR-15: Trees given to residents for Arbor Day 2019



Images NR-16, 17: Arbor Day 2019



Source: City of Conway

Mining

Mining is a major land use activity throughout Horry County, and is defined as (1) the breaking of soil to facilitate or accomplish the extraction or removal of ores or mineral solids for sale or processing or consumption in the regular operation of a business, or (2) the removal of overburden lying above natural deposits or ore or mineral solids and removal of the minerals deposits exposed, or by removal of ores or mineral solids from deposits lying exposed in their natural state (*A Guide to Mining in Horry County – Horry County Stormwater Management*).

While Horry County is the home to a number of surface mining companies, they are not located within the City of Conway and they do not mine minerals. However, there are three mines that are located in close enough proximity to the City limits that over time, they could possibly be annexed into the City that mine sand and clay. Sand mining is mainly extracted from open pits.

- Buck Mine, located at Hwy 378 adjacent to G&G Mine, sand is mined.
- Lee's Landing Circle Mine, located at the east side of Lee's Landing mines sand and clay.
- Ricky's Dirt Pile, located near the intersection of Faulk Circle and Cates Bay Highway, mines sand and clay.

UNIQUE PARKS AND RECREATION AREAS

Cox Ferry Lake Recreation Area

The Cox Ferry Lake Recreation Area located on Gary Lake Blvd is open daily and is part of the larger 35,000 acre Waccamaw National Wildlife Refuge. It offers three miles of interpretive nature trails, boardwalks, kiosks and a shelter with picnic tables. The trails are open for hiking, biking, environmental education and nature photography. Visitors can expect to see a variety of forest wildlife, including an array of plants and animals associated with bottomland hardwood habitats. The area also offers a bike trail.

City of Conway Recreation Center

The City of Conway opened its new Billy Gardner Recreation Center in 2011. It offers aquatic and fitness classes, a heated pool, a cardio room, fitness room, weight room, double gym and a walking track. Personal training and swim lessons are offered for an additional fee. The Recreation Center also has soccer, football, and baseball fields. The Recreation center was a goal of the 2019 Comprehensive Plan.

Blueways Paddle Trail (Conway Route)

The Conway Blueways Trail starts and ends at the City of Conway Marina. It includes a short portion of the Waccamaw River before turning and extending into Kingston Lake and the Crabtree Canal.

Additional information is provided for the Blueways Trail in this document under Ecotourism.

Waccamaw River Park Trail

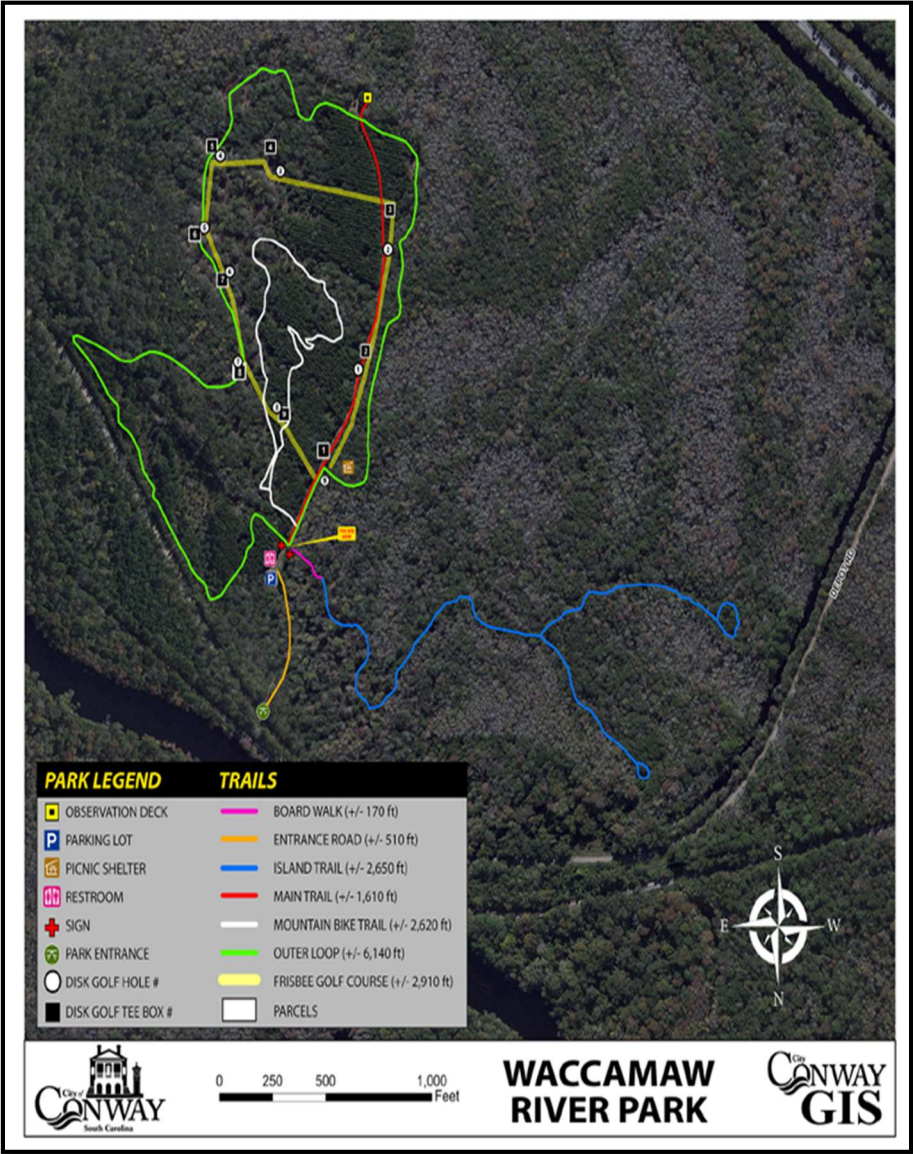
Opened to the public in June, 2017, the Waccamaw River Park is 237-acres; home to many species of fish, wildlife, plants, and trees in a thriving ecosystem. The park provides natural habitat associated with the Waccamaw River, including emergent wetlands, bottomland

hardwoods, and mixed pine forests. The purchase of the property was made possible through a partnership with The Nature Conservancy, and site amenities were provided through a grant from The Duke Energy Foundation. The park also provides a significant wildlife habitat for a variety of bird species. Amenities of the park include a picnic shelter, walking trails, a mountain bike trail, boardwalk, observation platform, 9-hole disc course, and plenty of nature to enjoy (*Conway Parks and Recreation*). **Map NR-14** (next page) shows a map of the Waccamaw River Park.

Image NR-18: Waccamaw River Park



Source: City of Conway Parks and Recreation



Conway Bike Routes

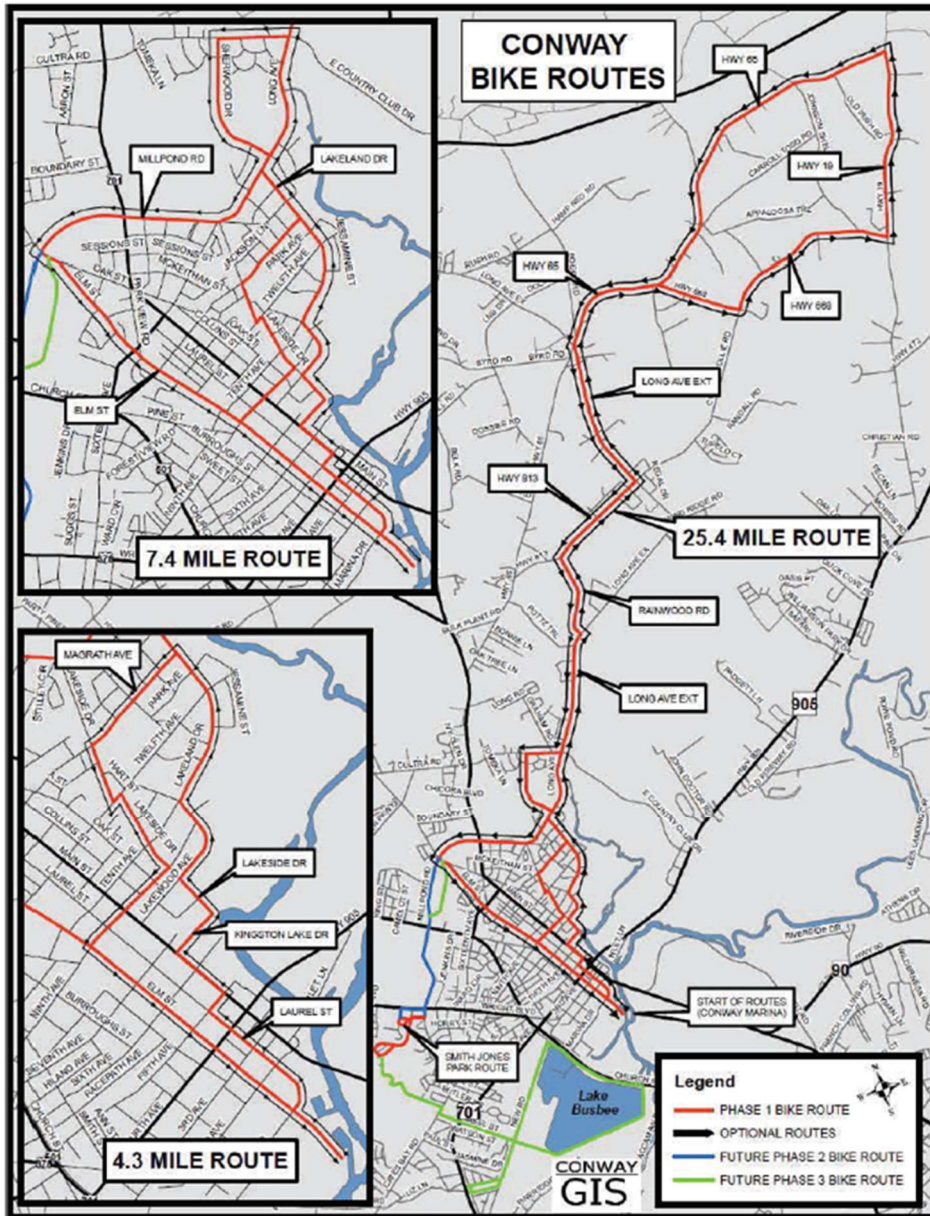
The City has a nearly 1-mile long paved and dedicated bike trail along Crabtree Swamp between Main Street and Long Avenue. Additionally, Conway has three on-road bike routes that consist of a 4.3-mile route, a 7.4-mile route, and a 25.4-mile route. There is also a walking/biking trail around Lake Busbee that is nearly 2.5 miles. Several subdivisions have installed bike trails as amenities that will provide future connections in years to come.

Crabtree Swamp, Oakey Swamp and Santee Cooper power line easements provide ideal locations for constructing bike trails throughout the City which can connect major points of public and private interests. **Map NR-15** (next page) shows existing bike routes in Conway.

Image NR-19: Bike/Walking Trail around Lake Busbee



Source: City of Conway



Source: City of Conway GIS

City Parks and Recreation Facilities

Conway has several parks located throughout the City, including:

- *Collins Park* (located at Sixteenth and Main) – Collins Park has two picnic pavilions, a large community playground, a gazebo, statue garden, tennis courts, basketball court, walking trail and fountain.
- *Riverfront Park* located on Elm Street on the Waccamaw River – Riverfront Park has a marina view, playground, fountain, free Wi-Fi, stage area, walking trails, and a gazebo.
- *Sherwood Park* and *Sherwood Forest Park* located at Sherwood Street and 16th Avenue – These parks are located across the street from one another and provide a walking trail, disc golf course, exercise stations, playground, picnic shelter, public restrooms, sand volleyball court and other passive uses.
- *Smith Jones Park* located on Highway 378 – Smith Jones Park is a large community park that has a baseball field, basketball courts, picnic shelters, tennis courts, and an outdoor swimming pool.
- *Conway Dog Park* at the former Public Works location on New Road – This dog park features small dog and large dog separated areas with drinking stations and dog play equipment.
- *Riverfront Tennis Center* (to be rebuilt) located at 7 Elm Street – After flooding in 2018, the Riverfront Tennis Center and courts were removed. The City is currently seeking Engineering Services to design 8 new Clay Courts and a Tennis Center.
- *Riverfront Marina* – The Riverfront Marina has permanent boat slips and a boat launch available. A marina store which sells gasoline for marine uses and other sundries is also located on site.
- *Conway Riverwalk* – The Conway Riverwalk is a mile-long boardwalk that meanders along the historic riverfront of Conway and ends at Riverfront Park. This amenity is one of the highest rated park features in the City and is a draw for tourists and residents alike.
- *Waccamaw River Park* - In 2016, The Nature Conservancy acquired more than 450 acres of forest land buffering either side of Highway 501 Business at the approach to the Main Street Bridge. 268 acres, located on the northeast side of Highway 501 Business was deeded to the City to be held in conservation. The remaining 184 acres were transferred to US Fish and

Wildlife, also to be held in conservation and added to the 35,000 acre Waccamaw National Wildlife Refuge. The City's acreage was converted to a park space with a picnic pavilion, trails, boardwalks, observation platforms, and a 9-hole disc golf. The park opened in June 2017.

Image NR-20: Riverfront Park

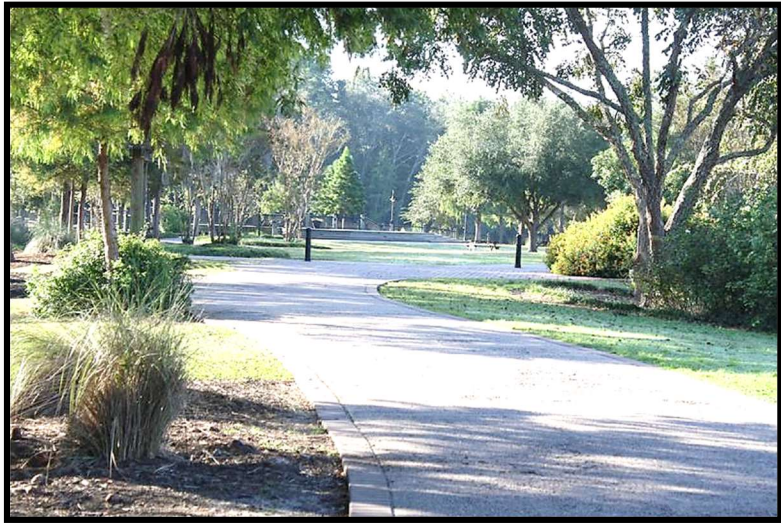


Image NR-21: Waccamaw River Park Boardwalk



Source: City of Conway

City of Conway Recreation Needs Assessment and Planning Report

During the spring and summer of 2017, a planning and evaluation team from Coastal Carolina University (CCU) conducted a parks and recreation needs assessment for the City of Conway, led by Dr. Don Rockey and Dr. Colleen McGlone with assistance from graduate students. The study's purpose was to determine current and future parks and recreation needs and planning priorities for Conway. The study engaged citizens in public meetings, study of peer/comparison communities and a town-wide needs assessment survey.

Survey respondents identified five top facilities / sites where they would like more opportunities:

- More hiking, walking trails and paths (55%)
- Bike lanes/paths (49%)
- Outdoor pool (43%)
- Indoor performing arts space (40%)
- Greenways (40%)

The needs assessment developed the following recommendations:

- Build relationships to expand opportunities across the Waccamaw River to the eastern part of Conway including a relationship with Coastal Carolina University to assist in the provision of recreation; particularly the cultural arts.
- Create a multi-faceted marketing plan to promote facilities, programs, and parks that the department has to offer while also creating community awareness
- Focus on basic maintenance and upkeep of neighborhood park and playground facilities, and provide renovations to accommodate safe, active, non-formal recreation and play.
- Extend partnerships with the Horry County to expand multi-modal trail networks and connectivity throughout the town (Crabtree Greenway).
- Create and maintain partnership opportunities with relevant stakeholders, including businesses and organizations that are aligned

with and share the values and the City of Conway regarding parks and recreation provision.

- Create more places for outdoor recreation and nature-based activities.
- Work on raising PRT funding up to average based on in-state peers.

Park and Open Space Dedication Requirements

Per Section 10.3.9 of the City's *Unified Development Ordinance (UDO)*, the applicant of any residential development or Planned Development District is required to reserve land within the development for park, recreation and/or open space designed to serve the residents of the development and residents of the immediate neighborhood of the development. The land must be designated for ownership and maintenance by a property owner's association (City of Conway UDO). Open space areas may include either passive or active use parks. The amount of open space that is required is calculated based on the number of lots in the development and the average household size based on the latest US Census. Open space requirements apply only to major subdivisions (5 or more lots), and is required to be installed in the first phase of the development. Additionally, open space is required to be preserved in perpetuity.

Conservation Subdivisions

Section 10.4.1 General Requirements for Conservation Subdivisions, of the UDO, states a conservation subdivision design preserves open space while maintaining the prorated density of residential units for the overall site area. Natural density is achieved by allowing smaller individual owned residential lots in neighborhoods that include or are adjacent to aesthetically and ecologically important areas. The goal of the design process is to identify and set aside conservation areas prior to the delineation of transportation and residential pod layouts. Open space areas include wetlands, stream buffer zones, woodlands, farmlands, playing fields, and meadows, depending on the resources

of the land. The purpose of conservation subdivisions includes the following:

1. Preserve significant areas of land for ecological, recreational, and agriculture purposes in perpetuity.
2. Afford greater flexibility of design and placement of buildings and structures.
3. Preserve and protect exceptional terrain, natural beauty, or sites of historic interest.
4. Preserve the Waccamaw River and its streams and tributaries or natural resources.
5. Prevent flooding, erosion, and water pollution, and protect the quality and quantity of drinking water.
6. Preserve wetlands, aquifers, topographical or soil features, marine and wildlife habitat; and other features having conservation values, including views, vistas, and indigenous vegetation.
7. Promote interconnected greenways and corridors throughout the City.
8. Promote contiguous open space with adjacent jurisdictions.

Table NR-6 (next page) provides an overview of the available incentives for development provisions.

Table NR-6: Overview of Available Incentives for Conservation Subdivisions

Development Provision	Description	Development Credit
River / Wetland Protection Buffers	Min. buffer width of 30'	1 additional dwelling unit per acre of provided mandatory buffer area
Trails & Open Space Connectivity	Provision of multi-use trails & greenways that connect with existing ones to create network	Reduction in required side yard setback to zero (0) feet to allow zero-lot developments
Additional Open Space	Provision of additional natural open space above required percentage (30% of net buildable area)	1 additional dwelling unit per every 1 acre of additionally preserved open space
Low-Impact Development	Incorporation of site-specific stormwater treatment & water conservation practices (e.g. through constructed wetlands, raingardens, bio-swales, cisterns)	1 additional dwelling unit per 1 acre of impervious area of locally treated stormwater runoff
Sustainable Landscaping / Xeriscaping	Planting of native trees, shrubs, and perennials in proposed landscaping to conserve water, reduce maintenance, & offer micro wildlife habitat	2 additional dwelling units per 1 acre of native landscaped area including rainwater reuse or other water recycling system
Energy Efficient & Sustainable Design Features	Implementation of state-of-the-art energy efficiency & sustainable building standards (alternative heating & cooling; insulation standards; orientation) as endorsed by S.C. Energy Office (Green Bldg. Programs)	5 feet increase in max building height (total 45 feet) for implementation of latest Energy Building Codes (SC Energy Office)

Source: City of Conway UDO

ECO-TOURISM

The term eco-tourism was first defined in 1982 as "tourism to areas of ecological interest, especially to support conservation efforts and observe wildlife; special access to an endangered environment controlled so as to have the least possible adverse effect" (*Green Global Travel, 2018*). Today, the meaning of ecotourism has evolved into now being responsible travel to natural areas that conserves the environment, socially and economically sustains the well-being of local people, and creates knowledge and understanding through interpretation and education of all involved. In other words, in order to be considered eco-friendly, ecotourism must make a positive impact on both the ECOlogy and ECONomy of a given destination (*Green Global Travel, 2018*).

Ecotourism is about uniting conservation, communities and sustainable travel, meaning that participants who implement and involved in market ecotourism activities should adopt the following ecotourism principles (*The International Tourism Society (TIES), 2018*):

- Minimize physical, social, behavioral and psychological impacts
- Build environmental and cultural awareness and respect
- Provide positive experiences for both visitors and hosts
- Provide direct financial benefits for conservation
- Generate financial benefits for both local people and private industry
- Deliver memorable interpretive experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates
- Recognize the rights and spiritual beliefs of the Indigenous People in your community and work in partnership with them to create empowerment.

Ultimately, ecotourism should involve three main things: the wellbeing of the local environment, the wellbeing of the locals and the high-quality experience of the tourist (*ZME Science, 2018*).

The City of Conway offers a variety of ecotourism opportunities, with a potential for even more. Many public facilities and parks are already available for use for the citizens of Conway and visitors. There are also a number of projects underway or in the planning stages.

Greenway Master Plan

The Greenway Master Plan was completed in 2005. As part of the Plan, the Conway Bicycle and Pedestrian Committee chose six greenway corridors as the initial greenway corridors to be developed first as part of the Conway Greenway Master Plan. Priority corridors were chosen based on the following factors: overall connectivity, existing facilities served by and within the corridor, historic nature of the area and user experience levels.

The City of Conway's *Unified Development Ordinance (UDO)* discusses connectivity in *Section 6.5.2.G.3 Gateway Corridor Overlay (GCO)*, and requires pedestrian and bicycle access to be provided to individual developments and to each establishment within the development. Pedestrian walkways must be designed and located in a manner that does not require pedestrians to walk through parking lots or cross driveways.

The UDO also addresses trails in *Section 6.5.3 G.3, Village Corridor Overlay (VCO)* in that it requires if a parcel is located within five hundred (500') feet of a proposed greenway/bike trail, a minimum eight (8') feet wide trail connection shall be provided.

Regional and Local Ecotourism along the Waccamaw River

The Waccamaw River Heritage Preserve River Trail with 5,347 acres to the north of Conway and the Waccamaw National Wildlife Refuge with 18,620 acres to the south have protected a significant amount of the River for present and future generations. The City of Conway and other entities like the Winyah Rivers Foundation and the Crabtree Swamp Stream Restoration Initiative will play a major role in adding Crabtree

Swamp and Kingston Lake to these major efforts and highlight Conway as a center for ecotourism activity on the Waccamaw River.

Blueways Paddle Trail (Conway Route)

The more recent addition of the Master Plan is the Conway Blueways Trail that includes stretches of Crabtree Canal, Kingston Lake, and the Waccamaw River and ends at Jackson Bluff Landing. The Blueways Trail starts and ends at the City's Marina and includes a short portion of the Waccamaw before turning and extending into Kingston Lake and the Crabtree Canal. The entire route takes about a half-day to navigate. This section is part of the overall Waccamaw River Blue Trail that when completed, starts at the North Carolina border and runs through Horry County and Georgetown County. Blue Trails are used by paddlers, fisherman, hikers, picnickers, and provide a quiet way to relax and get exercise (*Conway Parks and Recreation*).

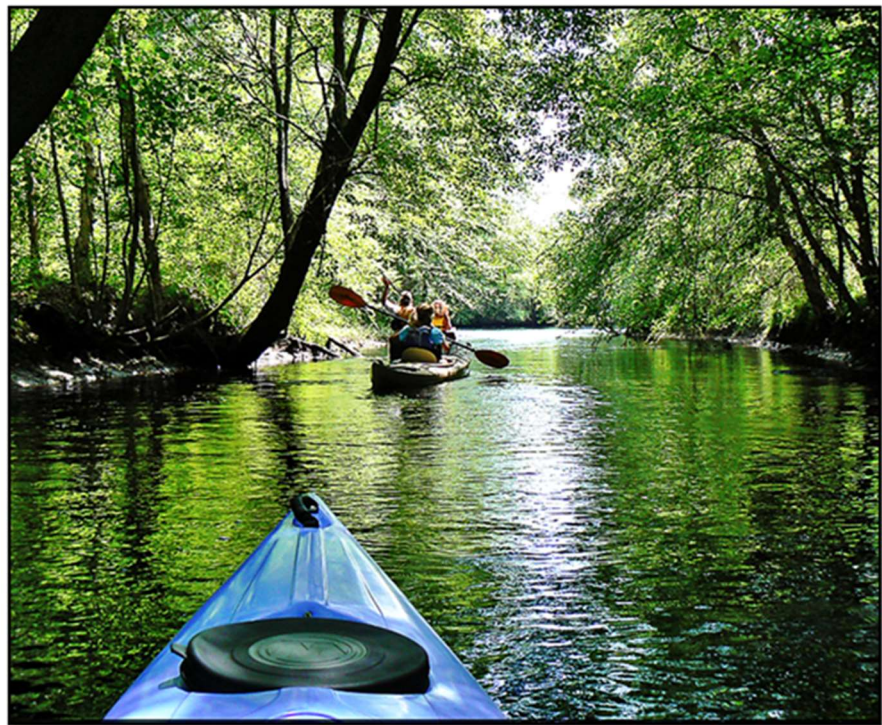
With the 2007 addition of the U.S. Fish and Wildlife project on West Cox Ferry Rd, this trail provides Conway with another recreational opportunity for its citizens and visitors.

Waccamaw River Blue Trail

The Waccamaw River Blue Trail extends the entire length of the river in North and South Carolina (*US Fish and Wildlife Service (USFWS)*). The blue trail begins near the Waccamaw River Heritage Preserve in South Carolina and connects urban and rural communities to the National Wildlife Refuge before ending at Winyah Bay (*American Rivers*). American Rivers, Waccamaw RIVERKEEPER, and many local partners worked together to establish the Waccamaw River Blue Trail to provide greater access to the river and its recreation opportunities. A "blue trail" is a river adopted by a local community that is dedicated to improving family-friendly recreation, such as fishing, boating, and wildlife watching, as well as conserving riverside land and water resources. Blue Trails help communities improve recreation and tourism, benefit local businesses and the economy, and protect river health for the benefit of

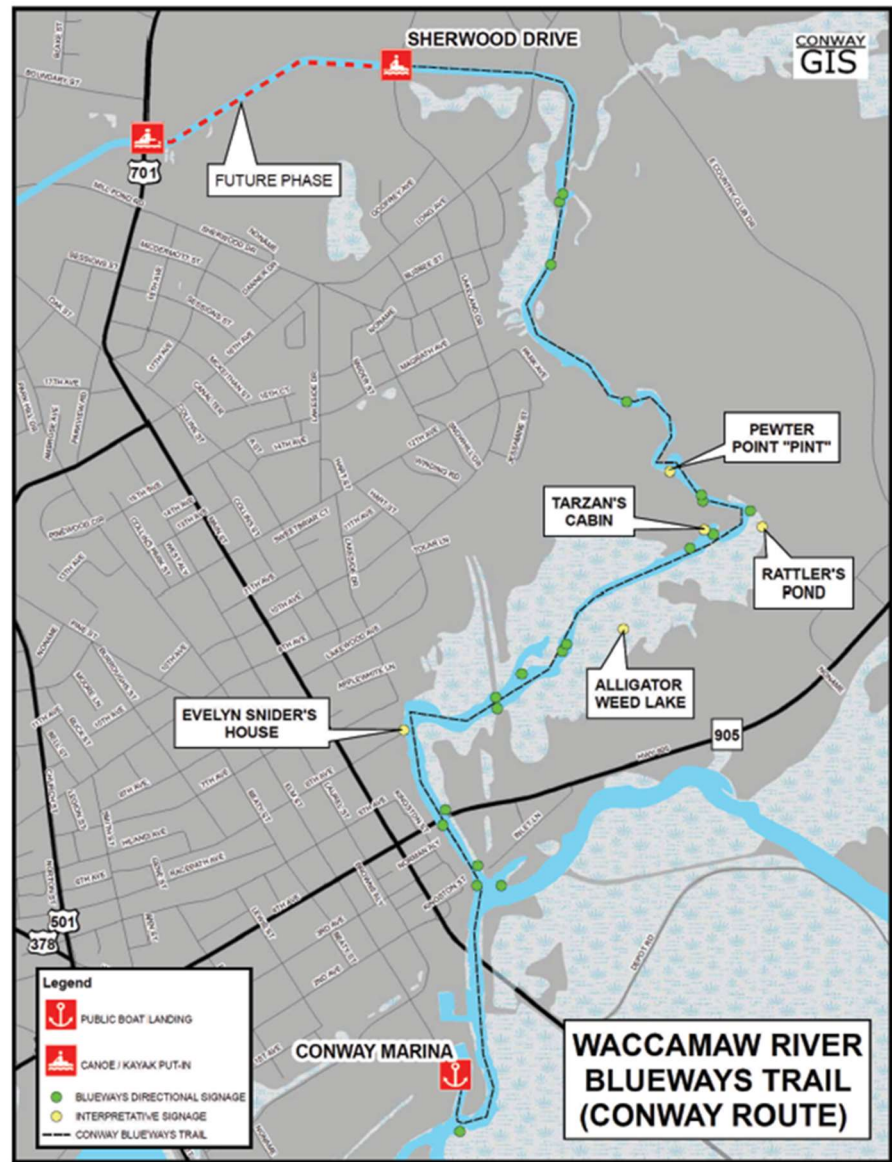
people, wildlife and future generations (USFWS). **Map NR-16** (right) shows the Conway route of the trail.

Image NR-22: Blueways Paddle Trail Participants



Source: Blue Trails Guide

Map NR-16: Waccamaw River Blueways Trail (Conway Route)



Source: Conway GIS

Area Outdoor Outfitters and Paddling Clubs

There are many outfitters within a four-county area: Horry, Georgetown, Charleston and Marion counties that use the ocean, marshes, and rivers with boats, kayaks and canoes for a wide variety of activities. These outfitters are located in Conway, Marion, Georgetown, Myrtle Beach and Awendaw. Typical trips and activities that are offered by these outfitters include hiking, backpacking, sea and river kayaking, canoeing, camping, environmental education and orienteering. Most outfitters offer overnight and nighttime trips and meals may be provided. One outfitter is along the riverfront in Conway. The Conway Marina Store also has kayaks and canoes for rent.

There are two paddling clubs in Horry County: The Long Bay Paddlers (Myrtle Beach) and the Lazy Navy (Murrells Inlet). The Long Bay Paddlers have trips on the Waccamaw River as part of their yearly trip schedule.

Waccamaw Outfitters

Waccamaw Outfitters, a family owned business which offers guided boat tours and rentals along the Waccamaw River, is currently located at the Conway Marina. They also offer unique apparel that promotes the Waccamaw River and City. In 2018, Waccamaw Outfitters serviced the following number of people:

- Kayak Rentals: 509 people
- Kayak Tours: 99 people
- Pontoon River Tours: 560 people

Source: www.waccamawoutfitters.com

Area Boat Landings

County owned parks and boat landings on the Waccamaw, Little Pee Dee and Great Pee Dee within the Conway area and within the City limits are listed below. All boat ramps shown are approx. 30 minutes or less from downtown and less than 30 miles away. Many of the boat ramps are adjacent or within close proximity to either the Waccamaw

River Heritage Preserve River Trail properties or are part of the Waccamaw National Wildlife Refuge, which is owned by the U.S. Fish and Wildlife Service.

Waccamaw River

- Conway Marina: 2 boat ramps, landings, parking (in City limits)
- Bucksville Landing: 2 ramps, a dock, paved with 6 parking spaces and has .25 acres
- Lee's Landing: 1 ramp, unpaved and has .5 acres
- Pitch Landing: 2 ramps
- Reeves Ferry Landing: 1 ramp, paved with 26 parking spaces and has 3.8 acres
- Savannah Bluff Landing: 2 ramps, unpaved and has .85 acres

Little Pee Dee River

- Jordan Lake Landing: 1 ramp, unpaved, and has .54 acres
- Punch Bowl Landing: 2 ramps, 1 dock, paved with 25 parking spaces and has 2 acres

Great Pee Dee River

- Yauhannah Landing: 2 ramps, 1 dock, paved with 30 parking spaces and has 1 acre.
- Pitts Landing: 2 ramps, unpaved
- Port Harrelson Landing: 1 ramp, unpaved and has 1.38 acres

Conway has many tourism assets other communities do not have and should strive to expand its programs to draw visitors. With the number of tourists that are already visiting the Grand Strand, day trips offer a lucrative market opportunity for Conway. Finally, Conway should continue to communicate with the South Carolina Dept. of Parks, Recreation and Tourism to gain their recognition of Conway part of a tourism destination area and as a tourism site.

Winyah Rivers Alliance

Winyah Rivers Alliance, established in 2001, is a nonprofit, grassroots organization of people from North and South Carolina that oversees the watersheds of the Lower River Pee Dee Basin, representing a drainage area of 11,700 square miles and including the Waccamaw, Lumber-Little Pee Dee, Lower Pee Dee (including the Sampit), Lynches, and Black Rivers; collectively referred to as the greater Winyah Bay watershed because all rivers ultimately discharge into Winyah Bay at Georgetown, SC. Winyah Bay is the largest estuary on the eastern seaboard (*Winyah Rivers*).

Winyah Rivers Alliance also hosts the Waccamaw RIVERKEEPER, which oversees the 1,640 square mile Waccamaw watershed in North and South Carolina (*Winyah Rivers*).

Threats to Natural Resources

The process of growth and development, which generates important economic activity, has profound impacts on a community's natural resources. As land use intensifies, the impacts on the natural resources also increase. Inevitably, these impacts lead to greater expense to maintain a high quality of life and healthy natural resources that support traditional uses, such as hunting, fishing, and boating (*Waccamaw Watershed Academy*).

The biggest source of water pollution throughout the nation, according to the U.S. Environmental Protection Agency (EPA), is non-point source pollution, or that coming from stormwater runoff that picks up contaminants as it flows over the land. In natural systems, rain is absorbed by trees and infiltrates into the soil becoming groundwater (*Nonpoint Education for Municipal Officials (NEMO)*). When development sites are cleared of vegetation and soil is covered with rooftops, roads, parking lots, sidewalks and driveways, these impervious surfaces prevent rainfall from percolating into the soil and convert it into runoff (*Nonpoint Education for Municipal Officials (NEMO)*). This disruption of the

natural water cycle leads to a series of changes in our waterways, including:

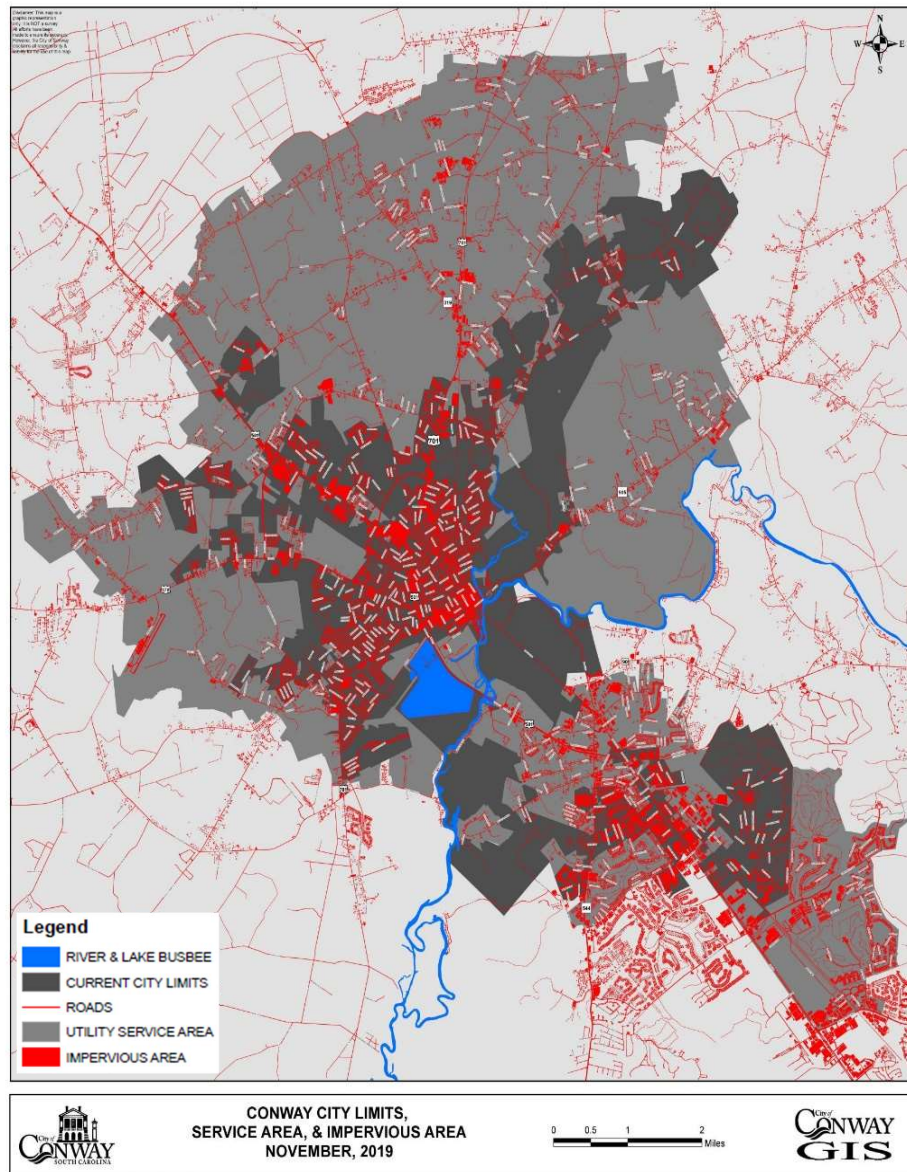
- Increased volume and speed of runoff
- Much greater peak storm flows
- Increased frequency and severity of flood events
- More stream channel erosion
- Loss of water storage capacity in soils, vegetation, and wetlands
- Reduced base stream flow from groundwater, most critical during dry weather

Many studies have found a direct relationship between the intensity of development (degree of imperviousness) and the level of water quality degradation (*Center for Watershed Protection*). These studies suggest that water quality begins to reach critical levels at imperviousness levels of 12-15%. Currently, Conway's Water and Sewer Service Area within the Kingston Lake Watershed has 9.05% coverage and Conway (City limits) has 13.15% coverage. **Map NR-17** (next page) shows current Conway impervious cover for the City and the entire Service Area. The cumulative effect of intensified land use on area waterways is increased sedimentation, erosion, flooding, pollutant loads, and water temperatures, as well as lower dry weather flows. Pollutants may include bacteria, litter, nutrients, toxic substances, and heavy metals and may threaten the traditional use of our waterways for fishing, hunting, swimming, boating and drinking water (*Waccamaw Watershed Academy*).

Another effect of growth and development, particularly with the prevalent pattern of suburban sprawl, is fragmentation of the landscape. Roads, buildings, and utilities divide land uses and natural habitat into smaller and smaller fragments. When this occurs, it becomes increasingly difficult for either land uses or habitat to be sustained. Many plant and animal species have specific habitat requirements that cannot be sustained when fragmentation occurs.

Likewise, land uses, particularly rural ones, can no longer be sustained when they are endlessly fragmented (WWA).

Map NR-17: Conway's Impervious Surface Cover



Summary of Findings

In the community workshops held, and through surveys conducted to gather public input for the Comprehensive Plan's Future Land Use Plan, river protection and preservation, as well as overall environment preservation, were perceived as being very important for the Conway community. Suggestions provided by Conway residents in the survey included river clean up, increased building elevations, redesign of Crabtree Canal, increased retention ponds, maintenance of drainage systems, elevated flood-prone roadways, creating an additional route across the river, discouragement of building in or near flood prone zones and wetlands, among others. It is clear that Conway residents understand that with rapid growth taking place, negative impacts on our natural resources may be inevitable if great care is not taken to properly plan for and monitor its impact in order to minimize growth's effect.

Because natural resource management should be considered critical in all areas of planning, the City should develop goals that are regional or consider natural resource boundaries like watersheds and minimum habitat requirements for wildlife. The interconnected nature of our natural resources require us to take into account all environmental impacts when planning for Conway's future. The City should continue working with citizens and other agencies to improve flood mitigation measures.

Primary Goal

Support proactive regional efforts to protect, preserve and monitor the natural resources of Conway in order to achieve and maintain a sustainable community. Promote a comprehensive holistic approach to minimize environmental impacts on the natural resources of the Conway area. Cooperate in efforts to enhance the rich natural heritage of Conway.

Goals, Objectives and Strategies for Implementation

Goal 1: Land Resources	
Promote Wise use of Conway's Land Resources while protecting scenic areas and fragile landscapes and increasing Open Space for the Conway community. Consider and minimize the negative impacts of land use on our water resources and other natural resources. Stress the connection between land use and water resources in all appropriate land use regulations.	
Objective: Integrate natural resource considerations into the planning efforts of the City.	
Strategies:	
Update GIS mapping for all natural resources including existing protected areas and utilize mapping to evaluate the UDO and other regulations to ensure quality open space and natural resources are being protected	On-going
Educate staff, council, and board members about species and habitats	On-going
Incorporate SCDNR heritage database into GIS mapping (listed species information)	Short-term
Address wetlands protection and floodplain protection in revisions to the UDO that effectively protect these areas and allow development to occur	Short-term
Schedule / attend quarterly meetings with natural resource agencies to share information or planning purposes. Develop interagency goals for natural resource management	Short-term
Develop an Urban Forestry Plan for Conway, which actively promotes yearly tree plantings that will include native species to benefit birds and pollinators	Long-term
Pursue an expanded Farmers Market concept to include agritourism with the US Dept. of Agriculture and local non-profits	Long-term
Consider incentives for developers such as transferrable development rights and conservation subdivisions	Long-term
Objective: Support and promote regional efforts for natural resource planning	
Strategies:	
Support SCDNR in their efforts to add property to the Heritage Preserves. Research possibilities of an open space land trust	On-going
Support US Fish and Wildlife Service in their efforts to add properties to the National Wildlife Refuge	On-going
Coordinate open space and recreation efforts, including the Greenway Plan with Horry County	On-going

Educate the public about conservation easement opportunities to landowners as an alternate option to selling land for development	On-going
Seek input from community and other local government partners on all related ordinances and plans that are natural resource related	On-going
Objective: Encourage and incentivize sustainable development activities that minimize and mitigate the impact on the natural environment and avoid adverse impacts on existing development	
Strategies:	
Promote the use of native plants by distributing the City's landscaping ordinance and Tree Preservation Ordinance to developers and property owners	On-going
Revise the UDO (design standards) to include additional landscaping requirements for residential lots (residential design standards)	Short-term
Consider revising the landscape and buffer ordinance to increase the width of required landscape buffers along major roadways, including those within the Gateway Corridor Overlay (GCO)	Long-term
Work with the County to require properties that are contiguous to the City to work with the City Arborist to preserve trees on such properties in accordance with the City's Tree Preservation Ordinance prior to development or clear-cutting of such properties	Long-term
Objective: Preserve natural areas landscapes and scenic views. Also address the wildlife threat associated with fragmentation	
Strategies:	
Address invasive exotic plant invasions in City parks and other properties. Plant native trees and shrubs to benefit native wildlife and pollinators	Long-term
Consider wider vegetative buffers in addition to reductions of flooding impacts and water quality improvements to benefit animal habitats / native wildlife	Long-term
Work with local, state, and federal entities purchasing land for habitat preservation	On-going
Encourage developers to create and/or preserve lands of similar quantity and size to that which they impact	On-going
Work with local partners to mitigate impacts of existing and future transportation corridors to ensure that wildlife habitat fragmentation is minimized	On-going
Objective: Reduce littering in order to protect City habitats, wildlife, and recreation spaces / scenic areas	
Strategies:	
Educate residents / visitors about the impacts of litter on the environment and property values	On-going
Support and promote volunteer efforts for litter reduction and the need for community education and enforcement	On-going
Provide clean up supplies and safety training for volunteer-led cleanups	On-going
Engage businesses, churches, and community groups to lead and support litter reduction and beautification initiatives of roadways coming into and out of the City, City parks, and Open Spaces / scenic and conservation areas	On-going
Continue to work toward becoming a Keep America Beautiful Affiliate	Short-term
Objective: Encourage the creation and preservation of a green infrastructure network through land development practices	
Strategies:	
Protect environment resources in all land development through the use of conservation design techniques by identifying green infrastructure and designing around those features	Short-term

Encourage environmental setbacks and buffering. Respect sensitive environment features by not encroaching or building directly up against them	On-going
Open space, including but not limited to, passive areas, playgrounds, ball fields, pedestrian trails, and water features shall continue to be intentionally incorporated into all development practices	On-going
Update open space regulations for higher density developments. Create density bonuses for larger residential projects to promote more open areas with passive open space	Short-term
Support ongoing progress toward greater community sustainability through improved energy savings, environment resource protection, and recycling efforts	On-going
Leave green infrastructure features in their natural state, untouched, except for passive recreation uses such as trails, when reasonable	Long-term
Objective: Facilitate the conservation of environmentally sensitive areas within the City limits of Conway. Conserve the essential pollution filtering, groundwater recharge, and habitat functions of wetlands and floodplains	
Strategies:	
Continue to work with SCDHEC and Santee Cooper to assure that Lake Busbee is properly managed and maintained; and that the health and safety of the residents of Conway are paramount	On-going
Work with partners of the Upper Waccamaw River Task Force to acquire and preserve wetland tracts bordering the Waccamaw River, Crabtree Swamp, and other flood prone areas	On-going
Work to connect the conserved areas as a greenbelt with trails and other publicly usable amenities	On-going
Objective: Management of regulatory flood plains and special flood hazard areas	
Strategies:	
Help to minimize future flooding risks / losses by increased regulations, policies, education and training	On-going
Develop a Floodplain Management Plan and Repetitive Loss Area Analysis that meets the National Flood Insurance Program's Community Rating System (CRS) scoring criteria	Short-term
Evaluate the feasibility of prohibiting fill within a flood zone	Long-term
Evaluate / develop a riparian and wetland buffer ordinance between development and water resources to allow for flood retention and the natural infiltration of pollutants	Long-term
Provide incentives for developers to prepare contiguous areas of natural vegetation and wetlands in residential communities for flood retention	Short-term
Develop a flood resiliency plan	Short-term
Meet with concerned citizens regarding their properties in and out of the flood zone; particularly with the implementation of an expanded flood map	On-going
Periodically inspect in the flood zone area(s) to help citizens better prepare for floods	Short-term
Work with GIS to implement flood maps and improve damage assessments in the event of a flood	On-going
Attend workshops through FEMA regarding future disaster planning	On-going
Attend classes on flood and mitigation where available	On-going
Work closely with The Nature Conservancy (TNC) on identifying current and future areas vulnerable to flooding and implementation of an on-the-ground project that protects, restores, and improves the management of lower order streams connected to the Waccamaw River	On-going

Continue policy of retreat from flood prone areas	On-going
Goal 2: Water Resources	
Continue to protect and enhance the water resources that are of good quality and improve the water resources that need to be improved	
Objective: Continue efforts to restore water surface quality in the greater Conway area	
Strategies:	
Partner with the Waccamaw Watershed Academy (WWA) in the development and implementation of the EPA funded Kingston Lake Watershed Plan and support the expansion of the water monitoring program	Short-term
Continue the efforts of the City Stormwater Program, the Water Quality and Drainage Commission, and Coastal Waccamaw Stormwater Educational Consortium in addressing the six minimum control measures of the NPDES Phase II Stormwater Program: 1 – Public Education and Outreach 2 – Public Involvement 3 – Illicit Discharge Detection and Elimination 4 – Pollution Prevention and Good Housekeeping in Municipal Operations 5 – Construction Site Runoff Control 6 – Post-construction Stormwater Management in New Development and Redevelopment	On-going
Participate in the RIVERKEEPER Program during Waccamaw River Cleanup events	On-going
Continue to participate in the efforts of the Crabtree Canal Improvement Initiative	On-going
Utilize Best Management Practices in the City's Stormwater Management Program with emphasis on reduction of pollution and sediment control in addition to flood control	On-going
Objective: Initiate and continue efforts to address water conservation	
Strategies:	
Publicize and encourage water conservation measures citywide to reduce water consumption	On-going
Educate the public to incorporate Stormwater Best Management Practice measures that control and slow down stormwater runoff by infiltration to provide multiple benefits such as drought moderation, flood mitigation, and water quality maintenance	On-going
Be cognizant and support statewide legislation that addresses water conservation concerns such as interbasin transfer and requirements for large water users	On-going
Develop a program for Good Housekeeping measures for existing City buildings and properties	On-going
Continue working with local partners to understand the effects of our land use on watershed	On-going
Objective: Enhance the beauty and support the recreational use of the Waccamaw River, Kingston Lake and Crabtree Canal	
Strategies:	
Continue to partner with local area programs to promote ecotourism and actively seek outdoor outfitters	On-going
Continue to integrate and develop / encourage / grow the Blueways Trail and the City's Greenway Plan	On-going
Develop a minimum impact trail along the river on the City property south of the Main Street bridge	Long-term
Hold a design workshop to update Conway's Riverfront plan. Consider ecological riverfront design options and provide high quality improvements that address stormwater issues	Short-term
Continue to improve Conway's Riverfront with the completion of additional phases	On-going
Support the efforts of the US Fish and Wildlife Service with the West Cox Ferry Project. Include as a destination in the Blueways Trail	On-going

Promote and support the Waccamaw River Blue Trail	On-going
Seek Scenic River status for the Waccamaw River through the SC Dept. of Natural Resources Scenic River Program	Short-term
Objective: Ensure that Conway's drinking water quality and water quantity is maintained	
Strategies:	
Continue to monitor / rebuild the City's wells and elevated tanks for water quality and quantity	On-going
Work with Grand Strand Water and Sewer Authority to ensure drinking water quality and quantity	On-going
Use the South Carolina Water Plan for regional and local planning efforts	On-going
Work with SCDHEC and the Natural Resource Conservation Service to address issues that affect water quality	On-going
Objective: Improve the City's understanding of water quality protections and drainage problems	
Strategies:	
Continue cooperation with local partners in understanding the effects of our land use on watersheds	On-going
Coordinate with SCDHEC, GSWSA, and the county to identify and map locations of septic systems on properties that are contiguous to the City and require connection to a sewer system (City connection) when septic systems fail to perform properly	Long-term
Prepare / update comprehensive drainage maps for the City using up-to-date stormwater infrastructure, land cover and elevation data	On-going
Work with the Coastal Waccamaw Stormwater Education Consortium to provide water quality education to a variety of audiences	On-going
Goal 3: Air Resources	
Take measures and promote efforts that will maintain good air quality for Conway	
Objective: Establish policies to address City vehicle maintenance and use	
Strategies:	
Develop requirements to limit idling of City vehicles when not in use	On-going
Promote best practices for the fuel-efficient operation of City vehicles and equipment through employee training and other information	On-going
Ensure that all City vehicles and motorized equipment are maintained at peak efficiency	On-going
Explore alternatives such as hybrid vehicles and biodiesel fuels. Approach oil companies to consider providing alternative fuel (ethanol) for City vehicles	Long-term
Objective: Encourage and plan for alternative modes of transportation	
Strategies:	
Continue to promote the use of the City's Greenway Plan	On-going
Complete and update (as needed) the sidewalk inventory and provide sidewalks in close proximity to schools	On-going
Plan transportation improvements with intermodal considerations	On-going

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Waccamaw Watershed Academy: <https://www.coastal.edu/wwa/>

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WMBF News: <http://www.wmbfnews.com/2019/02/05/workers-planting-k-saplings-former-lake-busbee/>

ZME Science: <https://www.zmescience.com/other/feature-post/what-is-ecotourism/>

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***Larger maps used within this document are available to the public upon request.**