Water Pollution Control

Watershed Water Quality Management Strategy

Catawba-Santee Basin

South Carolina DHEC
Department of Health and Environmental Control

Technical Report No.002-96

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Prepared by

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In memory of our Bureau Chief,
Russell W. Sherer (1943-1996).

Whose vision created the watershed program,
a mechanism to educate the public about water
quality and target problem waters for improvement.
His dedication to service lives on as an example to
all stewards of the envirionment.

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Introduction

The South Carolina Department of Health and Environmental Control (SCDHEC) initiated its first watershed planning activities as a result of a U.S. Environmental Protection Agency (USEPA) grant in June of 1972. These activities were soon extended by §303(e), "Federal Water Pollution Control Act Amendments of 1972", U.S. Public Law 92-500. In 1975, the SCDHEC published basin planning reports for the four major basins in South Carolina. The next major planning activity resulted from §208 of the Federal Water Pollution Control Act, which required states to prepare planning documents on an areawide basis. Areawide plans were completed in the late 1970's for the five designated areas of the State and for the nondesignated remainder of the State. To date, these plans or their updated versions have served as information sources and guides for water quality management.

During the past decade, special water quality initiatives and Congressional mandates have diverted attention and resources from comprehensive water quality assessment and protection. The Bureau of Water Pollution Control now emphasizes watershed planning to better coordinate river basin planning and water quality management. Watershed-based management allows the Department to address Congressional and Legislative mandates in a coordinated manner and to better utilize current resources. The watershed approach also improves communication between the Department, the regulated community, and the public on existing and future water quality issues (SCDHEC 1991a).

Purpose of the Watershed Water Quality Management Strategy

By definition, a watershed is a geographic area into which the surrounding waters, sediments, and dissolved materials drain, and whose boundaries extend along surrounding topographic ridges. Watershed-based water quality management recognizes the interdependence of water quality related activities associated with a drainage basin including: monitoring, problem identification and prioritization, water quality modeling, planning, permitting, and other activities. The Bureau of Water Pollution Control's Watershed Water Quality Management Program integrates these activities by watershed, resulting in watershed management plans and implementation strategies that appropriately focus water quality protection efforts. While an important aspect of the strategy is water quality problem identification and solution, the emphasis is on problem prevention.

Five major drainage basins divide the State along hydrologic lines and serve as management units. A Watershed Water Quality Management Strategy will be created for each of the five basins and will be updated on a five-year rotational basis. This will allow for effective allocation and coordination of water quality activities and efficient use of available resources. The Catawba-Santee Basin is divided into 3 watershed management units (WMU) and 47 watersheds or hydrologic units. The hydrologic units used are the USDA Soil Conservation Service 11-digit codes for South Carolina (USDA 1990). All water quality related evaluations will be made at the watershed level.

The watershed-based strategy fulfills a number of USEPA reporting requirements including various activities under §303(d), §305(b), §314, and §319 of the Clean Water Act (CWA). Section 303(d) identifies waters located within a watershed which do not meet applicable water quality standards and indicates where total maximum daily load (TMDL) development is applicable. Section 305(b) requires that the State biennially submit a report that includes a water quality description and analysis of all navigable waters to estimate environmental impacts. Section (§314) requires that the State submit a biennial report that identifies, classifies, describes and assesses the status and trends in water quality of publicly owned lakes. The watershed plan is also a logical evaluation, prioritization, and implementation tool for nonpoint source (§319) requirements. Nonpoint source best management practices (BMPs) can be selected by identifying water quality impairments and necessary controls, while considering all the activities occurring in the drainage basin.

The Strategy also allows for more efficient issuance of National Pollutant Discharge Elimination System (NPDES) and State wastewater discharge permits. Proposed permit issuances within a watershed will be consolidated and presented to the public in groups, rather than one at a time, allowing the Department to realize a resource savings, and the public to realize an information advantage.

The Watershed Water Quality Management Strategy is a geographically-based document that describes, at the watershed level, all water quality related activities that may potentially have a negative impact on water quality. Each watershed in the Catawba-Santee Basin is evaluated and a strategy described to address impaired streams.

Catawba-Santee Basin Description

The ***Catawba-Santee Basin*** incorporates 47 watersheds and some 3.5 million acres within the State of South Carolina (a portion of the basin resides in North Carolina). There are a total of 7,108.2 stream miles in the Catawba-Santee Basin and 307.7 square miles of estuaries. Within the Department's Catawba-Santee Basin are the Catawba-Wateree River Basin, the Santee River Basin, the Cooper River Basin, the Ashley River Basin, and a coastal basin.

The ***Catawba-Wateree River Basin*** encompasses 2,381.6 square miles with geographic regions that extend from the Piedmont to the Sandhills and to the Upper Coastal Plain. The Catawba-Wateree River Basin is described in Watershed Management Unit 0301, and encompasses 1,524,232 acres of which 3.9% is urban land, 12.0% is agricultural land, 7.4% is scrub/shrub land, 0.4% is barren land, 69.4% is forested land, 4.0% is forested wetland, 0.1% is nonforested wetland, and 2.8% is water (SCLRCC 1990). The urban land percentage is comprised chiefly of the City of Rock Hill and to a lesser extent the Camden-Lugoff-Elgin area. There are a total of 3,534.3 stream miles in the Catawba-Wateree River basin. The Catawba River crosses the State boundary near Charlotte, North Carolina flowing through Lake Wylie and into Fishing Creek Reservoir, Cedar Creek Reservoir, and Great Falls Reservoir. The Catawba River flows out of Cedar Creek Reservoir and joins Big Wateree Creek to form the Wateree River which flows through Wateree Lake. The Wateree River merges with the Congaree River Basin downstream to form the Santee River Basin.

The ***Santee River Basin*** is described in Watershed Management Unit 0302 and encompasses 11 watersheds and 1,208.3 square miles. The Santee River Basin originates in the Upper Coastal Plain region of the State giving way to the Lower Coastal Plain and the Coastal Zone regions. Of the 773,282 acres, 0.5% is urban land, 12.0% is agricultural land, 12.3% is scrub/shrub land, 0.5% is barren land, 42.5% is forested land, 16.8% is forested wetland, 4.2% is nonforested wetland, and 11.2% is water (SCLRCC 1990). There are a total of 1,506.1 stream miles in the Santee River Basin, and 55.3 square miles of estuarine areas. The Santee River is formed from the confluence of the Congaree and Wateree Rivers and flows through Lake Marion. The river is diverted in lower Lake Marion, and either flows out of the Santee dam to eventually drain into the Atlantic Ocean via the South Santee River and the North Santee River, or is channeled along a 7.5 mile diversion canal to fill Lake Moultrie. After flowing through the Santee dam, the Santee River is joined by the rediversion canal connecting Lake Moultrie and the (lower) Santee River.

The ***Cooper River Basin*** is described in Watershed Management Unit 0303 and encompasses 8 watersheds and 830.5 square miles. The Cooper River Basin incorporates the Lower Coastal Plain and Coastal Zone regions. Of the 531,536 acres in the Cooper River Basin, 9.4% is urban land, 2.7% is agricultural land, 4.3% is scrub/shrub land, 0.5% is barren land, 51.7% is forested land, 11.2% is forested wetland, 3.8% is nonforested wetland, and 16.4% is water (SCLRCC 1990). The urban land is comprised chiefly of the greater City of Charleston area. There are a total of 1,170.8 stream miles in the Cooper River Basin, and 60.1 square miles of estuarine areas. The diverted Santee River flows through Lake Moultrie's Pinopolis Dam and joins Wadboo Creek to form the

Cooper River. The Cooper River merges with Mepkin Creek to form the West Branch Cooper River, which then converges with the East Branch Cooper River to reform the Cooper River. The Cooper River then accepts drainage from the Back River, Goose Creek, and the Wando River before flowing into the Charleston Harbor and the Atlantic Ocean.

The ***Ashley River Basin*** is described in Watershed Management Unit 0303, and incorporates 5 watersheds and 587.7 square miles (22.7 square miles are estuarine areas). The Ashley River Basin consists of the Lower Coastal Plain and Coastal Zone regions of the State, and of the 376,128 acres in the basin, 12.6% is urban land, 4.1% is agricultural land, 7.2% is scrub/shrub land, 0.2% is barren land, 58.7% is forested land, 10.5% is forested wetland, 4.6% is nonforested wetland, and 2.1% is water (SCLRCC 1990). The urban land is comprised chiefly of the greater City of Charleston area. There are a total of 896.8 stream miles in the Ashley River Basin. The Cypress Swamp drains into the Great Cypress Swamp, which joins with Hurricane Branch to form the Ashley River. The Ashley River accepts drainage from several streams including Dorchester Creek, before draining into the Charleston Harbor and the Atlantic Ocean.

The ***Coastal Basin*** is also described in WMU-0303, and contains 2 watersheds and 334.5 square miles (183.8 square miles are estuarine areas) in the Coastal Zone region. This predominantly wetland watershed consists of 4.4% urban land, 1.6% agricultural land, 7.3% scrub/shrub land, 0.3% barren land, 30.2% forested land, 4.4% forested wetland, 32.2% nonforested wetland, and 19.6% water (SCLRCC 1990). The Intracoastal Waterway is the primary stream running through the saltwater basin. The Stono River and Awendaw Creek are the principal streams feeding the Intracoastal Waterway, which connects the coastal zone to the ocean.

Numerous studies, both ecological and water quality related, have been conducted in the Catawba-Santee Basin. The Santee-Cooper River Basin Project, within SCDHEC, conducted several water quality related research studies in the basin that included assessments of the Wateree River, the Santee Swamp, and Lakes Marion and Moultrie (the Santee-Cooper Lakes). The Department has also conducted numerous water quality related studies associated with potential problem areas such as Sugar Creek, Spears Creek, Fishing Creek, Walker Swamp, Wateree River, Stono River, and the Charleston Harbor.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service (USDA 1982). The MLRAs are physiographic regions that have soils, climate, water resources and land uses in common. The physiographic regions that define South Carolina are as follows.

The **Blue Ridge** is an area of dissected (separated by erosion into many closely spaced valleys), rugged mountains with narrow valleys dominated by forests; elevations range from 1,000 to 3,300 feet.

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms and orchards; elevations range from 375 to 1,000 feet.

The **Sand Hills** are an area of gently sloping to strongly sloping uplands with a predominance of sandy areas and scrub vegetation; elevations range from 250 to 450 feet.

The **Upper Coastal Plain** is an area of gentle slopes with increased dissection and moderate slopes in the northwestern section that contain the state's major farming areas; elevations range from 100 to 450 feet.

The **Lower Coastal Plain** is an area that is mostly nearly level and is dissected by many broad, shallow valleys with meandering stream channels; elevations range from 25 to 125 feet.

The **Coastal Zone** is a mostly tidally-influenced area that is nearly level and dissected by many broad, shallow valleys with meandering stream channels; most of the valleys terminate in tidal estuaries along the coast; elevations range from sea level to about 25 feet.

Land Use/Land Cover

General land use/land cover data for South Carolina was derived from SPOT multispectral satellite images using image mapping software to inventory the State's land classifications, which are as follows (SCLRCC 1990).

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial and residential uses, as well as vegetated portions of urban areas.

Agricultural/Grass land is characterized by cropland, pasture and orchards, and may include some grass cover in Urban, Scrub/Shrub and Forest areas.

Scrub/Shrub land is adapted from the western Rangeland classification to represent the "fallow" condition of the land (currently unused, yet vegetated), and is most commonly found in the dry Sandhills region including areas of farmland, sparse pines, regenerating forest lands and recently harvested timber lands.

Forest land is characterized by deciduous and evergreen trees not including forests in wetland settings.

Forested Wetland (swampland) is the saturated bottomland, mostly hardwood forests that are primarily composed of wooded swamps occupying river floodplains and isolated low-lying wet areas, primarily located in the Coastal Plain.

Nonforested Wetland (marshland) is dependent on soil moisture to distinguish it from Scrub/Shrub since both classes contain grasses and low herbaceous cover; nonforested wetlands are most common along the coast and isolated freshwater areas found in the Coastal Plain.

Barren land is characterized by an unvegetated condition of the land, both natural (rock, beaches and unvegetated flats) and man-induced (rock quarries, mines and areas cleared for construction in urban areas or clearcut forest areas).

Water (non-land) includes both fresh and tidal waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The watersheds all

contained up to 6-24 additional soil series not listed that made up the remaining land area percentage. The individual soil series for the Catawba-Santee Basin are described as follows (USDA 1963-1990).

Ailey soils are well drained loamy and sandy soils with clayey or loamy subsoil.

Alpin soils are well drained and excessively drained, sandy soils with a loamy or sandy subsoil.

Appling soils are well drained, deep soils, brownish to red, firm clay in the main part of the subsoil, found on narrow to broad ridges.

Bladen soils are poorly drained soils on low, nearly level areas and low ridges.

Bohicket soils are very poorly drained soils, clayey throughout or mucky and underlain with clayey layers, frequently flooded.

Bonneau soils are deep, moderately well drained soils with loamy subsoil on ridges.

Brookman soils are somewhat poorly drained to very poorly drained soils with a loamy surface layer and a loamy and clayey subsoil.

Cantey soils are moderately well drained soils with a loamy surface layer and a clayey or loamy subsoil and poorly drained soils with a loamy surface layer and a clayey subsoil.

Capers soils are very poorly drained soils, clayey throughout or mucky, and underlain with clayey layers, frequently flooded.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Chastain soils are poorly drained to well drained soils that are clayey or loamy throughout and are subject to flooding.

Chewacla soils are nearly level, somewhat poorly drained and well drained soils.

Chipley soils are moderately to excessively well drained soils, sandy throughout, on high ridges.

Chisolm soils are deep, well to moderately drained soils with sandy to loamy subsoil on nearly level to gently sloping terrain.

Daleville soils are nearly level, poorly drained soils, with silty loam in slight depressions and drainageways on upland terraces.

Emporia soils are well drained, gently sloping soils with surface and subsoils of loamy fine sand.

Enon soils are well drained to somewhat poorly drained, shallow to deep soils, mainly brownish, firm to extremely firm clay loam to clay in the subsoil, on narrow and medium ridges.

Faceville soils are well drained, sandy soils with a loamy or clayey subsoil.

Foxworth soils are well drained, sandy marine sediment derived, with acidic soils.

Georgeville soils are gently sloping to sloping, well drained and moderately well drained soils.

Goldsboro soils are moderately well to poorly drained soils with loamy subsoil on nearly level ridges and in shallow depressions.

Goldston soils are dominantly sloping to steep, well drained to excessively drained soils.

Helena soils are gently sloping to sloping, moderately well drained to well drained soils.

Herndon soils are gently sloping to sloping, well drained and moderately well drained soils.

Hiwassee soils are well drained, moderately sloping soils with clayey subsoil, moderately deep.

Hobcaw soils are nearly level, very poorly drained soils in depressions.

Iredell soils are well drained to somewhat poorly drained, shallow to deep soils, mainly brownish, firm to extremely firm clay loam to clay in the subsoil, on narrow and medium ridges.

Jedburg soils moderately well drained to poorly drained soils with a loamy surface layer and a thick, loamy subsoil that has a high silt content.

Kiawah soils are deep, somewhat poorly drained to poorly drained, acidic soils, sandy throughout, with a surface soil and subsoil of loamy fine sand.

Lakeland soils are well drained, sandy soils with loamy subsoil and excessively drained soils.

Leon soils are somewhat poorly drained to poorly drained, level to nearly level, sandy soils with weakly cemented layers stained by organic matter.

Levy soils are nearly level, very poorly drained soils, mucky throughout or loamy and underlain with clayey layers, rarely or frequently flooded with fresh water.

Lucy soils are well drained to poorly drained soils, some with a sandy surface layer and a loamy subsoil, and some are sandy throughout and subject to flooding.

Lynchburg soils are moderately well to poorly drained soils, with loamy subsoil, on nearly level ridges and in shallow depressions.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Marlboro soils are well drained soils with a sandy or loamy surface layer and a loamy or clayey subsoil.

Mecklenburg soils Deep to moderately deep, gently sloping to strongly sloping, well drained to somewhat poorly drained soils with a loamy surface layer and a clayey subsoil and underlain by decomposed bedrock.

Meggett soils are poorly drained to very poorly drained, level to nearly level soils with a loamy to sandy surface layer and a loamy to clayey subsoil.

Mouzon soils are poorly drained, loamy and sandy soils with a loamy subsoil.

Noboco soils are well drained, sandy soils with a loamy or clayey subsoil.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Pantego soils are moderately well drained and well drained soils with a sandy surface layer and a loamy subsoil, and very poorly drained soils that are loamy throughout.

Paxville soils are somewhat to very poorly drained soils, with loamy subsoil, on low ridges and in depressions.

Pelion soils are well drained and moderately well drained soils that have a sandy surface layer and a loamy subsoil, many with a fragipan in the subsoil.

Rains soils are moderately well to poorly drained soils, with a loamy subsoil, on nearly level ridges and in shallow depressions.

Rion soils are well drained, gently sloping to steep, deep to moderately deep clayey and loamy soils.

Rutledge soils are somewhat poorly drained to moderately well drained, nearly level, sandy soils on ridges and poorly drained to very poorly drained, sandy soils in depressions.

Tatum soils are dominantly sloping to steep, well drained to excessively drained soils, with a loamy subsoil, moderately deep or shallow to weathered rock.

Tawcaw soils are poorly drained to well drained soils that are clayey or loamy throughout and are subject to flooding.

Udorthents soils are mostly well drained soils forming in heterogeneous material from excavation or construction soil or refuse, or loamy, dredged material pumped onto low-lying marshy areas.

Vance soils are deep to moderately deep, gently sloping to sloping, well drained soils.

Vaucluse soils are well drained, loamy and sandy soils with clayey or loamy subsoil.

Wagram soils are well drained to very poorly drained, depressional to nearly level and gently sloping soils with a loamy to sandy surface layer and a clayey to loamy subsoil.

Wahee soils are poorly drained soils on low, nearly level areas and low ridges.

Wateree soils are well drained, loamy soils with a loamy or clayey subsoil.

Wilkes soils are dominantly strongly sloping to steep, well drained soils.

Winnsboro soils are well drained, gently sloping to steep, moderately deep to deep clayey soils.

Yauhannah soils are poorly drained to moderately well drained soils with a loamy subsoil, on nearly level ridges and in shallow depressions.

Yemassee soils are poorly drained to moderately well drained soils with a loamy subsoil, on nearly level ridges and in shallow depressions.

Yonges soils are moderately well drained to poorly drained, nearly level soils with a sandy surface layer and a predominantly loamy subsoil.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot (USDA 1978), and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values in this assessment were derived from the Nonpoint Source Pollution Assessment (SCLRCC 1988), where values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments which do erode. The range of K-factor values in the Catawba-Santee Basin is from 0.10 to 0.43, among the 47 hydrologic units or watersheds.

Factors Assessed in Watershed Evaluations

Water Quality

Monitoring Overview

In an effort to evaluate the State's water quality, the Department operates a permanent Statewide network of primary ambient monitoring stations and flexible, rotating secondary and watershed monitoring stations (SCDHEC 1993a). The ambient monitoring network is directed towards determining long-term water quality trends, identifying locations in need of additional monitoring efforts, and providing background data for planning and evaluating stream classifications and standards.

The monitoring data are also used in the process of formulating permit limits for wastewater discharges with the goal of maintaining State and Federal water quality standards and criteria in the receiving streams. These standards and criteria define the instream chemical concentrations which provide for protection and reproduction of aquatic flora and fauna, support the use classification of each waterbody, and serve as instream limits for the regulation of wastewater discharges or other activities. In addition, these data are used in the preparation of the biennial §305(b) report to Congress (SCDHEC 1994a), which summarizes State waters with respect to use classification attainment by comparing the ambient monitoring network data to the State Water Quality Standards. The ambient monitoring network, as a program, involves sampling a wide range of media and analyzing them for the presence or effects of contaminants.

The SCDHEC Water Quality Monitoring Network is comprised of three station types: primary, secondary, and watershed stations. Primary stations are sampled on a monthly basis year round, and are located in high water-use areas or as background stations upstream of high water-use areas. The static primary station network is operated statewide, and receives the most extensive parameter coverage, thus making it best suited for detecting long term trends. Secondary stations are sampled monthly from May through October within the targeted basin, as well as selected areas outside the Basin.

Secondary stations are located in areas where specific monitoring is warranted due to point source discharges, or areas with a history of water quality problems. Secondary station parameter coverage is less extensive and more flexible than primary or watershed station coverages. The number and locations of secondary stations have greater annual variability than do those in the primary station network, and may have additional sampling or parameter coverage during a basin's target year by mimicking primary or watershed stations.

Watershed stations are sampled on a monthly basis, year round, during a basin's target year; additional watershed stations may be sampled monthly from May through October to augment the secondary station network. Watershed stations are located to provide a more complete and representative coverage within the larger drainage basin for the identification of additional monitoring needs. The parameter coverage of watershed stations includes the same basic parameters as primary stations. Ambient monitoring data from 67 primary stations, 45 secondary stations, 31 watershed

stations, and 5 inactive stations were reviewed for the Catawba-Santee Basin. Twenty-one biological sites were sampled to assess the macroinvertebrate community. In addition, 53 sites monitored by Santee-Cooper Public Service Authority were reviewed to augment DO, pH, and fecal coliform data.

Monthly, quarterly or annual water column grab samples are used to establish representative physical conditions and chemical concentrations in the waterbodies sampled. This information is considered to represent "average" conditions related to the highly variable nature of flowing water situations. Water flows continuously and discrete inputs quickly proceed downstream. The immediate instream chemical concentrations resulting from nonpoint source inputs due to rain or from point source inputs of a variable nature are seldom measured. Routine sampling events rarely coincide with the time of the release; and the inputs may be undetectable by the monthly collection.

Many pollutants may be components of point source discharges, but may be discharged in a discontinuous manner, or at such low concentrations that water column sampling for them is impractical. Some pollutants are also common in nonpoint source runoff, reaching waterways only after a heavy rainfall; therefore, in these situations the best media for the detection of these chemicals are sediment and fish tissue, in which they may accumulate over time. Their impact may also affect the macroinvertebrate community.

Aquatic sediments represent a historical record of chronic conditions existing in the water column. Pollutants bind to particulate organic matter in the water column and settle to the bottom where they become part of the sediment "record". This process of sedimentation not only reflects the impact of point source discharges, but also incorporates nonpoint source pollution washed into the stream during rain events. As a result, contaminant concentrations originating from irregular and highly variable sources are recorded in the sediment. The sediment concentrations at a particular location do not vary as rapidly with time as do the water column concentrations. Thus, the sediment record may be read at a later time, unrelated to the actual release time. Lakes act as settling basins for materials entering the lake system directly from a discharge or indirectly from the land surface washed into streams. Therefore, it is not unusual for lake sediment concentrations to be higher than sediment concentrations found in streams. This is especially true for chromium, copper, and zinc.

Classified Waters, Standards, and Natural Conditions

The waters of the State have been classified in regulation based on the desired uses of each waterbody. State Standards for various parameters have been established to protect all uses within each classification. The water-use classifications (SCDHEC 1993b) are as follows.

Class ORW, or "outstanding resource waters", are freshwaters or saltwaters which constitute an outstanding recreational or ecological resource, or those freshwaters suitable as a source for drinking water supply purposes, with treatment levels specified by the Department.

Class FW, or "freshwaters", are freshwaters which are suitable for primary and secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters are suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class is also suitable for industrial and agricultural uses.

Class Trout Waters is comprised of three types of water:

trout natural waters, which are freshwaters suitable for supporting reproducing trout populations and a cold water balanced indigenous aquatic community of fauna and flora,

trout put, grow and take waters, which are freshwaters suitable for supporting the growth of stocked trout populations and a balanced indigenous aquatic community of fauna and flora,

trout put and take waters, which are freshwaters protected by the standards of Class FW.

Class SFH, or "shellfish harvesting" waters, are tidal saltwaters protected for shellfish harvesting, and are suitable also for uses listed in Classes SA and SB.

Class SA comprises "tidal saltwaters" suitable for primary and secondary contact recreation, crabbing and fishing. These waters are not protected for harvesting of clams, mussels, or oysters for market purposes or human consumption. The waters are suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

Class SB are "tidal saltwaters" suitable for the same uses listed in SA. The difference between the Class SA and SB saltwater concerns the DO limitations. Class SA waters must maintain daily DO averages not less than 5.0 mg/l, with a minimum of 4.0 mg/l, and Class SB waters maintain DO levels not less than 4.0 mg/l.

The Standards are used as instream water quality goals to maintain and improve water quality and also serve as the foundation of the Water Pollution Control program. They are used to determine permit limits for treated wastewater dischargers and any other activities that may impact water quality. Using mathematical Wasteload Allocation Models, the impact of a wastewater discharge on a receiving stream, where flow is unregulated by dams, is predicted using 7Q10 streamflows. These predictions are then used to set limits for different pollutants on the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department. The NPDES permit limits are set so that, as long as a permittee (wastewater discharger) meets the established permit limits, the discharge should not cause a standards violation in the receiving stream. All discharges to the waters of the State are required to have an NPDES permit and must abide by those limits, under penalty of law.

Classifications are based on desired uses, not on natural or existing water quality, and are a legal means to obtain the necessary treatment of discharged wastewater to protect designated uses. Actual water quality may not have a bearing on a waterbody's classification. A waterbody may be reclassified if desired or existing public uses justify the reclassification and the water quality necessary to protect these uses is attainable. A classification change is an amendment to a State regulation and requires public participation, SCDHEC Board approval, and General Assembly approval.

Natural conditions may prevent a waterbody from meeting the water quality goals as set forth in the Standards. The fact a waterbody does not meet the Standards for a particular classification does not mean the waterbody is polluted or of poor quality. Certain types of waterbodies (ie. swamps, lakes, tidal creeks) naturally have water quality lower than the numeric standards. A waterbody can have water quality conditions below standards due to natural caused and still meet its use classification. Several waterbodies have been given site specific Standards for pH and dissolved oxygen (SCDHEC 1993b Reg 61-69) which reflect natural conditions.

Wetlands

In the Section 401 water quality certification process, applications for wetland alterations may be denied or modified due to the special nature of a wetland or mitigated in part or entirely and new wetlands created. Future development would be prohibited in these newly created or legally protected areas. Knowledge of areas that are restricted from development due to mitigation or special water classification is useful in planning future development in a watershed. The list of outstanding resource waters (ORW) has been refined to include wetlands that qualify for, and should be afforded, the highest level of protection. In addition, wetlands that are not currently classified as ORW, but meet certain criteria (ie. absence of dischargers, endangered species, federal lands) will be noted as potential ORW candidates. In cooperation with the S.C. Department of Natural Resources's Division of Land Resources and Conservation Districts, Landsat Thematic Mapper (TM) satellite image data will provide an inventory of wetlands in the basin and an image-based geographical information system (GIS) for subsequent monitoring and tracking efforts.

Lake Water Quality Assessments

The Clean Lakes Program was established under §314(a) of the Clean Water Act of 1972, with the purpose of implementing methods and procedures to control sources of pollution affecting water quality in publicly-owned freshwater lakes and to restore deteriorated lakes. Specifically, through Lake Water Quality Assessments, conducted under §314, States identify and classify the trophic condition of publicly-owned and accessible freshwater lakes, establish procedures and methods to control lake pollution sources and to restore water quality, list and describe impaired lakes, and assess trends in lake trophic condition. A trend is indicated by consistently decreasing or increasing trophic index values over the three most recent sampling periods. Through the Clean Lakes Program, the USEPA has provided technical and financial assistance to the State to assess, protect and restore lake water quality. The following classification system was used to determine degree of eutrophication within the State's lakes and to direct focus appropriately toward preservation, protection or restoration (SCDHEC 1991b).

Water Quality Category I describes the most eutrophic lakes characterized by excessive nutrients, high productivity, the susceptibility to nuisance macrophyte growth, algal blooms, and/or high turbidity; further study is recommended.

Water Quality Category II describes lakes with an intermediate trophic condition, possibly susceptible to degradation; protection is recommended.

Water Quality Category III describes the least eutrophic lakes; preservation is recommended.

Lakes selected for further action are addressed in three phases with each phase dependent on available funding:

Phase I - Diagnostic/Feasibility Study
Phase II - Implementation
Phase III - Post Implementation Monitoring

Sanitary Bathing Areas

Many recreational water areas are permitted by the Department to insure public health requirements. The regional councils of government are cooperating with the Department by identifying additional swimming or bathing areas (regularly used beaches and river banks with public access) where water quality monitoring may be needed. Currently permitted and suggested areas are located and discussed in the appropriate watershed evaluations.

Shellfish Harvesting Waters

The Department's Shellfish Sanitation Program ensures that shellfish and the shellfish harvesting areas meet health and environmental quality standards. These standards are defined by State Regulation 61-47 (SCDHEC 1993b), and by operational manuals developed by the Interstate Shellfish Sanitation Conference (ISSC) and adopted by the USFDA. Shellfish harvesting season extends from September 15 to May 15 with up to a 15 day variance at the start or conclusion of the season. Sanitary surveys, conducted by the Department, assess the coastal waters and determine shellfish harvesting classifications based on actual water quality as follows:

Approved harvesting status is assigned to waters that are not contaminated with fecal material, pathogenic microorganisms, nor poisonous and deleterious substances in concentrations dangerous to human health. The fecal coliform MPN median or geometric median should not exceed 14 colonies/100 ml in the water, and 10% of the samples should not exceed 43 colonies/100 ml.

Conditionally Approved harvesting status is assigned to waters that are subject to temporary conditions of actual or potential pollution. Temporary decline in water quality may be caused by activities such as malfunctioning wastewater treatment plants or nonpoint source pollution after rainfall events. Fecal coliform standards in such waters are the same as for the approved classification.

Restricted harvesting status is assigned to waters where a limited degree of pollution renders the shellfish unsafe for direct marketing, but may be marketed after relaying or depuration. The median fecal coliform levels or geometric mean in restricted waters are between 14 and 88 colonies/100 ml, with not more than 10% of the samples exceeding 260 colonies/100 ml.

Prohibited harvesting status is assigned to waters with excessive concentrations of pollutants, or where the potential exists for excessive concentrations. This classification is ascribed to waters where the median fecal coliform MPN or geometric mean exceeds 88 colonies/100 ml, or more than 10% of the samples exceed 260 colonies/100 ml. Shellfish may not be harvested from prohibited areas for human consumption; however, prohibited status does not necessarily indicate lesser water quality, but may indicate a potential for variable water quality due to pollutant sources.

Water Quality Parameters

DISSOLVED OXYGEN

Oxygen is essential for the survival and propagation of aquatic organisms. If the amount of oxygen dissolved in water falls below the minimum requirements for survival, aquatic organisms or their eggs and larvae may die. A severe example is a fish kill. Dissolved oxygen (DO) varies greatly due to natural phenomena, resulting in daily and seasonal cycles. Different forms of pollution also can cause declines in DO.

Changes in DO levels can result from temperature changes or the activity of microscopic plants (algae or phytoplankton) present in a waterbody. The natural diurnal (daily) cycle of DO concentration is well documented. Dissolved oxygen concentrations are generally lowest in the morning, climbing throughout the day and peaking near dusk, then steadily declining during the hours of darkness. Photosynthesis by phytoplankton releases oxygen during the day, which results in a rise in DO. In the dark, respiration consumes DO and lowers the concentration.

There is also a seasonal DO cycle in which concentrations are greater in the colder, winter months and lower in the warmer, summer months. Secondary stations are only sampled during summer months when water temperatures are elevated and DO concentrations are depressed, resulting in higher percentages of DO values below Standards, since there are no high winter values. Streamflow (in freshwater) is lower during the summer and greatly affects flushing, reaeration, and the extent of saltwater intrusion, all of which affect dissolved oxygen values.

When comparing the SCDHEC data to DO standards, it is necessary to consider several extenuating circumstances that contribute to apparent noncompliance. The SCDHEC sampling protocols are biased to approximate worst case conditions resulting from the combination of the tidal, diurnal, and seasonal cycles. Samples are collected as a single instantaneous grab sample, which is not truly representative of the daily average used as the criterion for most classifications.

Secondary stations are sampled only during summer months and generally result in a higher rate of DO excursions as a result. It is essential to examine the data to ascertain such patterns of excursions before summarily concluding that the indicated violations constitute poor water quality. The impact of biased sampling protocols must also be weighed as a factor in instances of nonsupport of classified uses.

Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD_5) is a measure of the amount of dissolved oxygen consumed by the decomposition of carbonaceous and nitrogenous matter in water over a five-day period. The BOD_5 test indicates the amount of biologically oxidizable carbon and nitrogen that is present in wastewater or in natural water. Matter containing carbon or nitrogen uses dissolved oxygen from the water as it decomposes, which can result in a dissolved oxygen decline. The quantity of BOD_5 discharged by point sources is limited through the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department. The discharge of BOD_5 from a point source is restricted by the permits so as to maintain the applicable dissolved oxygen Standard.

pH

The hydrogen ion concentration in a water sample is defined as "pH", and is used as a measure of the acidity of the water. The pH scale ranges from 0 to 14 standard units (SU). A pH of 7 is considered neutral, with values less than 7 being acidic, and values greater than 7 being basic. pH may vary from the ranges specified in the standards due to a variety of natural causes. Low pH values are found in natural waters rich in dissolved organic matter, especially in Coastal Plain

swamps and black water rivers. The tannic acid released from the decomposition of vegetation causes the tea coloration of the water and low pHs.

High pH values in lakes during warmer months may be due to high phytoplankton (algae) levels. Continuous flushing in streams prevents the development of significant phytoplankton populations. Most phytoplankton are dormant during the cold winter months, and populations begin to increase as the water warms in the spring. The relationship between phytoplankton and pH is well established. Daily cycles in pH are common in waters with significant phytoplankton populations. Photosynthesis by phytoplankton consumes carbon dioxide during the day releasing carbonate, which results in a rise in pH. In the dark, respiration releases carbon dioxide and lowers pH. Soft water lakes and ponds may reach a pH of 9-10 SU during periods of intense photosynthesis when large phytoplankton populations are present; hence, excursions of pH beyond Standards may be the result of natural conditions.

Fecal Coliform Bacteria

Coliform bacteria are present in the digestive tract and feces of all warm-blooded animals, including humans, poultry, livestock, and wild game species. Fecal coliform bacteria are themselves generally not harmful, but their presence in surface waters may be serious due to their association with sewage or animal waste which may contain pathogenic microbes. At present, it is difficult to distinguish between waters contaminated by animal waste and those contaminated by human waste.

Diseases that can be transmitted to humans through water contaminated by improperly treated human or animal waste are the primary concern. Fecal coliform bacteria are able to survive in water and are usually more numerous than waterborne disease producing organisms (pathogens). Therefore, it is best to test for fecal coliform bacteria as an indicator of possible fecal contamination rather than to try to isolate the relatively few pathogens which may be present in water.

Public health studies have established a correlation between fecal coliform numbers in recreational and drinking waters, and the risk of adverse health effects. Based on these relationships, the USEPA and SCDHEC have developed enforceable standards for surface waters to protect against adverse health effects from various recreational or drinking water uses. Proper waste disposal or sewage treatment prior to discharge to surface waters minimizes this type of pollution.

Nutrients

'Nutrients', in terms of environmental water quality, usually refer to phosphorus and nitrogen, which are primary requirements for the growth and reproduction of aquatic plants. Oxygen demanding materials and nutrients are the most common constituents discharged to the environment by man's activities, through wastewater facilities and by agricultural, residential, and stormwater runoff. In general, increasing nutrient concentrations are undesirable due to the potential for accelerated growth of aquatic vegetation and algal blooms which may, in turn, deplete dissolved oxygen and result in fish kills.

The forms of nitrogen routinely analyzed at SCDHEC stations are ammonia (NH_3+NH_4/N), total Kjeldahl nitrogen (TKN), and nitrite-nitrate nitrogen (NO_2/NO_3). TKN assays the amount of

organic nitrogen and ammonia in a sample. Nitrate is the product of aerobic decomposition of ammonia, and is a primary aquatic plant nutrient. Total phosphorus (TP) is measured to determine the phosphorus concentration of surface waters. This test includes all of the various forms of phosphorus (organic, inorganic, dissolved, and particulate) present in a sample.

There are no official standards or criteria for nutrients in water. However, the USEPA has issued recommendations for total phosphate phosphorus concentrations in order to limit eutrophication. High densities of phytoplankton can cause fluctuations of pH and dissolved oxygen beyond standards. Since these are only recommendations, and not a true criterion for use in evaluating water quality, it is difficult to determine the significance of elevated TP values. Because TP includes all forms of phosphorus, including that incorporated into algal biomass, it would be necessary to consider biological data to properly assess the implications of observed concentrations.

Heavy Metals

The analytical procedures used by the Department measures total metal concentration, which is a relatively conservative approach, since the total metal concentration is always greater than the acid-soluble or dissolved fraction. Most heavy metal criteria for freshwater are calculated from formulas using water hardness. The formulas used to calculate criteria values are constructed to apply to the entire United States, including Alaska and Hawaii. As with all the USEPA criteria, there is also a large margin of safety built into the calculations. The applicability of the hardness based criteria derived from the USEPA formulas to South Carolina waters has been a subject of much discussion. Hardness values vary greatly nationwide (from zero into the hundreds), with South Carolina representing the lower end of the range (statewide average value is approximately 20 mg/l).

Representatives of the USEPA Region IV standards group have stated that no toxicity data for hardness values less than 50 mg/l were used in the development of the formulas. They have expressed reservations about the validity of the formulas when applied to hardness values below 50 mg/l. Based on this opinion, South Carolina's State Standards for metals are based on a hardness of 50 mg/l for waters where hardness is 50 mg/l or less, resulting in several criteria values below the Department's current analytical detection limits. Therefore, any detectable concentration of cadmium, copper, or lead is an excursion beyond recommended criteria.

The SCDHEC monitoring data has historically indicated that zinc and copper levels in South Carolina waters are elevated relative to USEPA criteria, apparently a statewide phenomenon in both fresh and salt waters, and possibly resulting from natural conditions or nonpoint sources. These levels do not appear to adversely affect state fisheries, which suggests that the levels are the result of long-term local conditions to which the fauna have adapted, as opposed to point source pollution events. It is difficult to assess the significance of heavy metal excursions due to the questionable applicability of the formulas at low hardness values and the occurrence of calculated criteria below present detection limits. Atmospheric inputs are recognized as important sources of metals to aquatic systems. Metals are released to the atmosphere from the burning of fossil fuels (coal, oil, gasoline), wastes (medical, industrial, municipal), and organic materials. The metals are then deposited on land and in waterways from the atmosphere via rainfall.

Methodology

At the majority of the SCDHEC's monitoring stations, samples for analysis are collected as single grab samples once per month, quarter, or year, depending on the parameter. Samples collected at a depth of 0.3 meters are considered a surface measurement or a "grab sample". The USEPA does not define the sampling method or frequency other than indicating that it should be "representative". The grab sample method is considered to be representative for the purpose of indicating excursions relative to criteria, within certain considerations. A single grab sample is more representative of a one-hour average than a four-day average, more representative of a one-day average than a one-month average, and so on; thus, when inferences are drawn from grab samples relative to criteria, sampling frequency and the intent of the standards must be weighed. When the sampling method or frequency does not agree with the intent of the particular standard, any conclusion about water quality should be considered as only an indication of conditions, not as a proven circumstance.

Dissolved oxygen, temperature, and pH are measured monthly at each station in situ according to standard procedures (SCDHEC 1994b) as dictated by their primary or secondary status. At many stations, these parameters are sampled as a water column profile, with measurements being made at a depth of 0.3 meters below the water surface and at one-meter intervals to the bottom. At other stations, these parameters were measured only at a depth of 0.3 meters. For the purpose of this assessment, only surface samples were used in the trend analyses and Standards comparisons. All water and sediment samples were collected and analyzed according to standard procedures (SCDHEC 1981, 1994a).

Macroinvertebrate community structure is analyzed routinely at selected stations as a means of detecting adverse biological impacts on the aquatic fauna of the state's waters due to water quality conditions which may not be readily detectable in the water column chemistry.

Results from water quality samples were compared to State Standards and USEPA criteria, with some consideration given to time of collection and sampling frequency. The time period used to assess Standards compliance was the last complete five years of data. This time period was chosen because the basin assessments will be updated every five years. For certain parameters, the monthly sampling frequency employed in the ambient monitoring network is insufficient for strict interpretation of the Standards. For the Standards comparisons (Appendices A, B, and C), columns headed with "EXC" are the number of values exceeding the standard. Columns headed "N" are the total number of surface samples considered in the 1989-1993 time period. The "%" columns are the percentage of values exceeding the standard. An excursion is a value outside of the appropriate range.

A dissolved oxygen standard of not less than 4 mg/l is used for Class SB, 6 mg/l for TPGT, and 5 mg/l for all other Classes. An excursion is an occurrence of a DO concentration less than the appropriate criterion. For fecal coliform bacteria, an excursion is an occurrence of a bacteria concentration greater than 400 colonies/100 ml for all Classes. As per the 305(b) report (SCDHEC 1994a), comparisons to the bacteria geometric mean standard od 200 colonies/100 ml was not considered appropriate based on sampling frequency and the intent of the standard. For pH, there are

several acceptable ranges applied depending on the Class of water: 6-8 SU for TPGT; 6-8.5 SU for FW; 5-8.5 SU for FW*; and 6.5-8.5 for SFH, SA, and SB.

In general, support of aquatic life uses are determined based on the percentage of DO and pH standard excursions, increases in water temperature due to heated effluents, and impacts to the macroinvertebrate community. Support for recreational uses is based on the frequency of fecal coliform bacteria excursions and the occurrence of bathing area closures. Class SFH standards for the consumption of shellfish are more strict than the 400/100 ml figure used to evaluate recreational use support. The decision to close an area to harvesting is made by SCDHEC's Shellfish Sanitation Section, based on a different system of monitoring stations and sampling frequency than that of the ambient monitoring network (SCDHEC, 1993a). Fish/shellfish consumption use support is determined by the occurrence of advisories or bans on consumption for a waterbody. Fish advisories are derived from the Department's Fish Tissue Monitoring Program and shellfish advisories from the Sanitary Surveys.

Specifically, for dissolved oxygen, pH and fecal coliform bacteria, a standards excursion percentage less than or equal to 10% of samples represents full support of uses. A percentage between 11-25 is considered partial support of uses and a percentage greater than 25 is considered to represent nonsupport of uses, unless excursions are due to natural conditions. For aquatic life uses, even if chemical conditions indicate full support, an adversely impacted macroinvertebrate community reduces use support to nonsupport status. For the support of fish consumption uses, a fish consumption advisory or conditionally approved shellfish harvesting status indicates partial use support, a consumption ban or shellfish harvesting closure indicates nonsupport of uses. This is in keeping with the intent of the most recent USEPA 305(b) guidance (USEPA 1993).

Water column and sediment data were reviewed for occurrences of toxic organic compounds. Those detected are discussed in the watershed narrative evaluations. Heavy metals and organic compounds in water and sediment were not used in the determination of use support unless available biological data indicated an impact to biological integrity, or the frequency of occurrence and concentration was extreme. Excursions of heavy metals above standards for the protection of aquatic life are summarized in the appendices and are referred to as "elevated" in the watershed narrative evaluations. The occurrence of ubiquitous elements or compounds (such as zinc, copper, etc.) were not discussed unless the concentration was unusually high, or the frequency of detection was high and in combination with other rarely detected pollutants.

The USEPA criteria for heavy metals to protect aquatic life specify the critera as a four-day average and a one-hour average (USEPA 1986). These criteria have been adopted as State Standards (SCDHEC 1993b). Because of the quarterly sampling frequency for heavy metals, the USEPA advises against comparisons to chronic toxicity criteria (4-day average concentration); therefore, only the one-hour average for the protection of aquatic life was used in the water quality assessment (Table 1). State Standards for human health for several heavy metals were also used in the assessment.

Metal	Present Detection Level	Freshwater 1-Hour Ave.	Saltwater 1-Hour Ave.	Human Health
*Cadmium	10.0	1.79	43.0	5.000
Chromium (VI)	10.0	16.00	1100.0	50.000
*Copper	10.0	9.22	2.9	
*Lead	50.0	33.78	140.0	50.000
Mercury	0.2	2.40	2.1	0.153
*Nickel	20.0	789.00	75.0	4584.000
*Zinc	10.0	65.00	95.0	
* Freshwater Standards based on a hardness of 50 mg/l as $CaCO_3$.				

Because zinc and copper are elevated statewide, concentrations are frequently measured in excess of the calculated acute aquatic life criteria. To identify areas where zinc and copper are elevated in the water column above normal background concentrations, concentrations greater than the detection limit from all SCDHEC monitoring sites statewide (collected between January, 1989 and December, 1993) were pooled and the 90th and 95th percentiles were computed (SCDHEC 1994c). This was done separately for each metal for both freshwater and saltwater. The individual measurements from the Catawba-Santee Basin were then compared to these percentiles. In the watershed narrative evaluations, a metal concentration is referred to as "high" if it was in the top 10% of the pooled results, and "very high" if it was in the top 5%. All water column values referred to as "high" or "very high" are also in excess of the acute aquatic life criterion listed in Table 1. This was also done for chromium, but because so few concentrations are above the detection limit, all samples collected were used to generate the percentiles. This same approach was used to identify sediments with elevated metals concentrations, since there are no standards for sediment (SCDHEC 1994c). Percentiles were constructed using statewide sediment data as discussed above. Only values greater than the detection limit were used for chromium, copper, nickel, lead, and zinc. Because so few concentrations of cadmium and mercury are measured above the detection limit, all samples were pooled for these metals. A sediment metal concentration was considered to be high if it was in the top 10% of the pooled results, and very high if it was in the top 5%. Occurrences of high or very high sediment concentrations are indicated in the watershed narrative evaluations.

For metals, columns headed "EXC" contain the number of values in excess of the aquatic life criterion. The column headed "N" is the total number of samples for the particular metal analyzed between 1989 and 1993. For metals with human health criteria, the median of the samples collected

during the five year period is listed in the column headed "MED". A potential human health threat is indicated if the median exceeds the human health criterion. Blank cells for metals indicate no metals samples were collected at those stations during the period of review.

Surface data from each station were analyzed for statistically significant long-term trends (Appendices A, B, and C) using a modification of Kendall's tau (Bauer *et al.* 1984, Hirsch *et al.* 1982, Smith *et al.* 1982, Smith *et al.* 1987). The modified Kendall test is a nonparametric test which also removes seasonal effects. The basic methodology utilized was that of Smith *et al.* (1982). Flows were not available for most stations, and the parametric concentrations were not flow-corrected. Seasonal Kendall's tau analysis was used to test for the presence of a statistically significant trend of a parameter, either increasing or decreasing, from January, 1980 through December, 1993. It indicates whether the concentration of a given parameter is exhibiting consistent change in one direction over the specified time period. A rigorous evaluation for trends in time-series data usually includes a test for autocorrelation. The data were not tested for autocorrelation prior to the trend analysis. It was felt that autocorrelation would not seriously compromise a general characterization of water quality trends based on a fourteen-year series of deseasonalized monthly samples.

One of the advantages of the seasonal Kendall test is that values reported as being below detection limits (DL) are valid data points in this nonparametric procedure, since they are all considered to be tied at the DL value. When the DL changed during the period of interest, all values were considered to be tied at the highest DL occurring during that period as suggested by Hirsch et al. (1982). Since it is possible to measure concentrations equal to the value of the DL, values reported as less than DL were reduced by subtraction of a constant so that they would remain tied with each other, but be less than the values equal to the DL. Since fecal coliform bacteria detection limits vary with sample dilution, there is no set DL; therefore, for values reported as less than some number, the value of the number was used.

Columns headed with "N" represent the number of samples utilized in the trend analyses. In the other trend related columns: "D" indicates a statistically significant declining trend (two-sided, $p \leq 0.1$); "I" indicates a statistically significant increasing trend (two-sided, $p \leq 0.1$); "*" indicates no statistically significant trend at $p = 0.1$; and blanks indicate that there were insufficient data to perform a trend analysis. Trend analyses for each station are discussed in the watershed narrative evaluations.

Point Source Contributions

Wasteload Allocation Process

A wasteload allocation (WLA) is the portion of a stream's assimilative capacity for a particular pollutant which is allocated to an existing or proposed point source discharge. Existing WLAs are updated during the basin review process and included in permits during the normal permit expiration and reissuance process. New WLAs are developed for proposed projects seeking a discharge permit or for existing discharges proposing to increase their effluent loading at the time of application. Wasteload allocations for oxygen demanding parameters are developed by the WLA Section, and WLAs for toxic pollutants and metals are developed by the appropriate permitting division.

The ability of a stream to assimilate a particular pollutant is directly related to its physical and chemical characteristics. Various techniques are used to estimate this capacity. Simple mass balance/dilution calculations may be used for a particular conservative (nondecaying) pollutant while complex models may be used to determine the fate of nonconservative pollutants that degrade in the environment. Waste characteristics, available dilution and the number of discharges in an area may, along with existing water quality, dictate the use of a simple or complex method of analysis. Projects which generally do not require complex modeling include: ground water remediation, noncontact cooling water, mine dewatering, air washers, and filter backwash.

Streams are designated either effluent limited or water quality limited based on the level of treatment required of the dischargers to that particular portion of the stream. In cases where the USEPA published effluent guidelines, the minimum treatment levels required by law are sufficient to maintain instream water quality standards, and the stream is said to be effluent limited. Streams lacking the assimilative capacity for a discharge at minimum treatment levels are said to be water quality limited. In cases where better than technology limits are required, water quality, not minimum requirements controls the permit limits. The Department's Wasteload Allocation Section recommends limits for numerous parameters including ammonia nitrogen (NH3-N), dissolved oxygen (DO), total residual chlorine (TRC), and five-day biochemical oxygen demand (BOD5). Limits for other parameters, including metals, toxics, and nutrients are developed by the Municipal Wastewater Division or Industrial and Agricultural Wastewater Division in conjunction with support groups within the Department.

TMDL Definition

A Total Maximum Daily Load (TMDL) is the calculated maximum allowable pollutant loading to a waterbody at which water quality standards are maintained. A TMDL is made up of two main components, a load allocation and a wasteload allocation. A load allocation is the portion of the receiving water's loading capacity attributed to existing or future nonpoint sources or to natural background sources. The waste load allocation is the portion of a receiving water's loading capacity allocated to an existing or future point source. A TMDL may also include an unallocated portion of the capacity reserved as a margin of safety or for future development.

TMDLs form links between water quality standards and point and nonpoint source controls. In water quality impaired areas, the TMDL process provides a mechanism to integrate management of point and nonpoint source pollution. Section 303(d) of the Clean Water Act requires states to identify waters that are water quality impaired, whether as a result of nonattainment of point or nonpoint source related water quality standards, or if controls more stringent than minimums set in effluent guidelines are deemed necessary. Where applicable, TMDLs are to be developed by the states in order to achieve nonattained water quality uses, and results are submitted to USEPA for approval. Waterbodies included on the §303(d) high priority list (SCDHEC 1994d) are targeted for TMDL development. Section 304(l) of the Act requires states to identify all point sources discharging any toxic pollutant that is believed to be impairing stream water quality and to indicate the amount of the toxic pollutant discharged by each source.

Permitting Strategy

The Domestic Wastewater Division and the Industrial and Agricultural Wastewater Division are responsible for drafting and issuing NPDES permits. All NPDES permits in the Catawba-Santee Basin are to be drafted and issued, or revoked and reissued by September 30, 1995, and will all be reissued together in 2000. Catawba-Santee Basin permits that remain unissued after September 30, 1995 will be issued during the first quarter of Fiscal Year 96. These permits will also be reissued in 2000 to coincide with the basin permitting year. Major and minor NPDES reissued permits will be individually public noticed in a newspaper of general circulation and the site will be posted. New NPDES permits and modifications of existing NPDES permits will be issued as the need arises. New permits and modifications of existing permits will be public noticed by newspaper advertisement and site posting. The permitting Divisions will coordinate drafting of permits for reissue and public notices in the Catawba-Santee Basin by watershed management units in 2000.

The permitting Divisions use general permits with statewide coverage for certain categories of minor industrial NPDES permits. Discharges covered under general permits include utility water, potable surface water treatment plants, potable ground water treatment plants with iron removal, petroleum contaminated ground water, and mine dewatering activities. Additional activities proposed for general permits include bulk oil terminals, aquacultural facilities, and ready-mix concrete/concrete products. Land application systems for land disposal and lagoons are also permitted, and the municipal, community (private), and industrial land application systems will be included in this document as well as NPDES point source dischargers.

A completed draft permit is sent to the permittee, the SCDHEC District office, and if it is a major permit, to the USEPA for review. When the permit draft is finalized, a public notice is issued. Comments from the public are considered and, if requested, a public hearing may be arranged. Both oral and written comments are collected at the hearing, and after considering all information, the Department staff makes the decision whether to issue the permit as drafted, issue a modified permit, or to deny the permit. Everyone who participated in the process receives a copy of the final staff decision. It is anticipated that minor permits will be grouped by watershed and publicly noticed together; major permits will individually stand public review. Staff decisions may be appealed according to the procedures in Regulation 61-72.

Nonpoint Source Contributions

Nonpoint source pollutants are generally introduced to a waterbody during a storm event and enter the system from diverse areas. Nonpoint source contributions originate from a variety of activities that include agriculture, silviculture, construction, urban storm water runoff, hydrologic modification, landfills, mining, and residual wastes. A computer model was developed by the former SCLRCC (1988) which incorporated general land cover data, stream length information, and general soil associations by watershed, into the SEDCAD+ software package to determine relative levels of NPS pollution in terms of waterway sedimentation.

Section 319 of the 1987 Amendments to the Clean Water Act requires states to assess the nonpoint source water pollution associated with surface and ground water within their borders and

then develop and implement a management strategy to control and abate the pollution. The first Assessment of Nonpoint Source Pollution in South Carolina (SCDHEC 1989) fulfills the §319 requirement. The NPS Management Program (SCDHEC 1989) developed strategies and targeted waterbodies for priority implementation of management projects. The priority list has been updated several times since then. Comprehensive projects are currently being implemented in a number of these watersheds. Components of the projects vary depending on the particular NPS impacts in the watershed, but all include BMP demonstrations, education, and monitoring.

Section 6217 of the 1990 Coastal Zone Act Reauthorization Amendments (CZARA) requires states with federally approved Coastal Zone Management Programs to develop Coastal Nonpoint Source Pollution Control Programs. At the federal level, the program is administered and funded jointly by the National Oceanic and Atmospheric Administration (NOAA) and EPA. In South Carolina, the Department's Office of Ocean and Coastal Resource Management and the Bureau of Water Pollution Control are responsible for development and implementation of the program. The Department submitted a State Nonpoint Source Pollution Management Program which satisfies the requirements of §6217 and §319, in October 1995.

The purpose of South Carolina's Nonpoint Source Pollution Management Program is to insure the protection and restoration of the state's waters from nonpoint source water pollution impacts. The Plan document describes programs (both regulatory and voluntary) for NPS abatement, targets watersheds for NPS project implementation, and describes the state's strategy under each of the eight categories of NPS sources identified in South Carolina. In each of the categorical sections management measures are described. Management measures are defined in §6217 as "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution". The management measures address the following major categories: agriculture, forestry, urban areas, marinas/recreational boating, hydromodification, mining, land application of wastes, and wetlands. The Nonpoint Source Management Program incorporates the WWQMS, and NPS projects will be implemented during the same time frame.

Landfill Activities

All Landfill activities within the State are permitted and regulated by the Department's Bureau of Solid and Hazardous Waste. All active and closed industrial and municipal solid waste landfills, as well as hazardous waste landfills are identified in the appropriate watershed evaluations.

Mining Activities

Mining activities within the State are permitted by the Mining and Reclamation Division of the Department's Bureau of Solid and Hazardous Waste. Soil excavation activities and locations are identified in the appropriate watershed evaluations.

Ground Water Concerns

Ground water is an important resource for drinking water use, together with agricultural, industrial and commercial usages. Based on USEPA Drinking Water Standards, the overall quality of South Carolina's ground water is excellent. Contaminated ground water is expensive and difficult to restore; therefore, ground water protection for present and future usage is the management emphasis.

Localized sources of ground water contamination can include: septic tanks, landfills (municipal and industrial), surface impoundments, oil and gas brine pits, underground storage tanks, above ground storage tanks, injection wells, hazardous waste sites (abandoned and regulated), salt water intrusion, land application or treatment, agricultural activities, road salting, spills and leaks. For the purposes of this assessment, only ground water contamination affecting surface waters will be identified. A more detailed accounting of ground water contamination will be addressed in the Catawba-Santee Basin update in 1999. The ground water contamination inventory (SCDHEC 1993c) was used to identify ground water-related problem areas in the basin. Sites in the inventory are referenced by name and county, and are updated annually.

Storm Water Contributions

Storm water arises from precipitation during rain events, which washes runoff from industrial, agricultural, construction, and household sites directly into streams or into drainage systems that eventually drain into streams. The EPA National Storm Water Permit Program focuses on municipal and industrial pollution prevention to assist in controlling storm water pollution. The Department has general permit authority for industrial dischargers and regulated construction site dischargers. General permits require development of pollution prevention plans to identify BMPs that will control storm water discharge pollutants. If the BMPs are ineffective in protecting water quality, an individual permit is required to resolve the problem.

The Department is responsible for issuing NPDES storm water permits to prevent degradation of water quality. The Department also issues permits for sediment and erosion control for construction sites. To date, the Department has received 385 individual permit applications statewide and 2,898 notices of intent (NOI) to receive a general permit (1,631 industrial and 1,267 construction permits). Permits for municipal systems allow communities to design storm water management programs that are suited for controlling pollutants in their jurisdiction. There are two population-based categories of municipal separate storm sewers: large municipal (population greater than 250,000) and medium municipal (population between 100,000 and 250,000). In this basin, Charleston County and the City of Charleston must obtain a comprehensive municipal permit that addresses storm water within their jurisdiction. All other municipalities in this basin are defined as medium municipalities.

Water Supply

Water treatment facilities are permitted by the Department for municipal and industrial potable water production. As per the 1983 Water Use Reporting and Coordination Act (Act 282), all water uses over 100,000 gallons per day must report their usage. This includes industrial, agricultural, mining, golf courses, public supply, commercial, recreational, hydro power, thermo power, and nuclear power activities. Intake location and the volume removed from a stream are identified in the watershed evaluations for both municipal (potable) and industrial uses.

Growth Potential and Planning

Land use and management, can define the impacts to water quality in relation to point and nonpoint sources. Assessing the potential for an area to expand and grow allows for water quality planning to occur and, if appropriate, increased monitoring for potential impairment of water quality. Indicators used to predict growth potential include water and sewer service, road and highway accessibility, and population trends. These indicators and others were used as tools to determine areas within the Catawba-Santee Basin having the greatest potential for impacts to water quality as a result of development.

The regional Councils of Governments (COGs), located within the three watershed management units (WMU) of the Catawba-Santee Basin include: the Catawba Regional Planning Council in WMU-0301, the Santee-Lynches Council of Governments in WMU-0301 and WMU-0302, the Central Midlands Regional Planning Council in WMU-0301, and the Berkley-Charleston-Dorchester Council of Governments in WMU-0302 and WMU-0303. The Councils of Governments were requested to identify areas of high growth potential that could adversely impact future water quality (Catawba Regional Planning Council 1994; Santee-Lynches Council of Governments 1994; Central Midlands Regional Planning Council 1994; Berkeley-Charleston-Dorchester Council of Governments 1994). The COGs also provided locational information on the landfills and recreational waters in their regions.

Many counties in the Catawba-Santee Basin lack county wide zoning ordinances; therefore, there is little local regulatory power to influence the direction or magnitude of regional growth. The majority of municipalities have zoning ordinances in place; however, much of the growth takes place just outside the municipal boundaries, where infrastructure is inadequate. The §208 Areawide Water Quality Management Plans were completed in great detail during the 1970's and are outdated. The process of updating the plans is currently underway. Public review and input will be sought as part of the process in 1996. If you are interested in participating, call your regional Council of Government or SCDHEC for more information.

Watershed boundaries extend along topographic ridges and drain surrounding surface waters. Roads are commonly built along ridge tops, with the best drainage conditions. Cities often develop in proximity to ridges as a result of their plateau terrain. It is not uncommon, then, to find cites or road corridors located along watershed boundaries, and thus influencing or impacting several watersheds.

Watershed Evaluations and Implementation Strategies Within WMU-0301

Watershed Management Unit 0301 consists primarily of the ***Catawba-Wateree River Basin***, which originates in the Piedmont region of the State, and flows through the Sandhills and Upper Coastal Plain regions. The Catawba-Wateree River Basin encompasses 21 watersheds, some 1.5 million acres of which 3.9% is urban land, 12.0% is agricultural land, 7.4% is scrub/shrub land, 0.4% is barren land, 69.4% is forested land, 4.0% is forested wetland, 0.1% is nonforested wetland, and 2.8% is water (SCLRCC 1990). There are a total of 3,534.3 stream miles in WMU-0301.

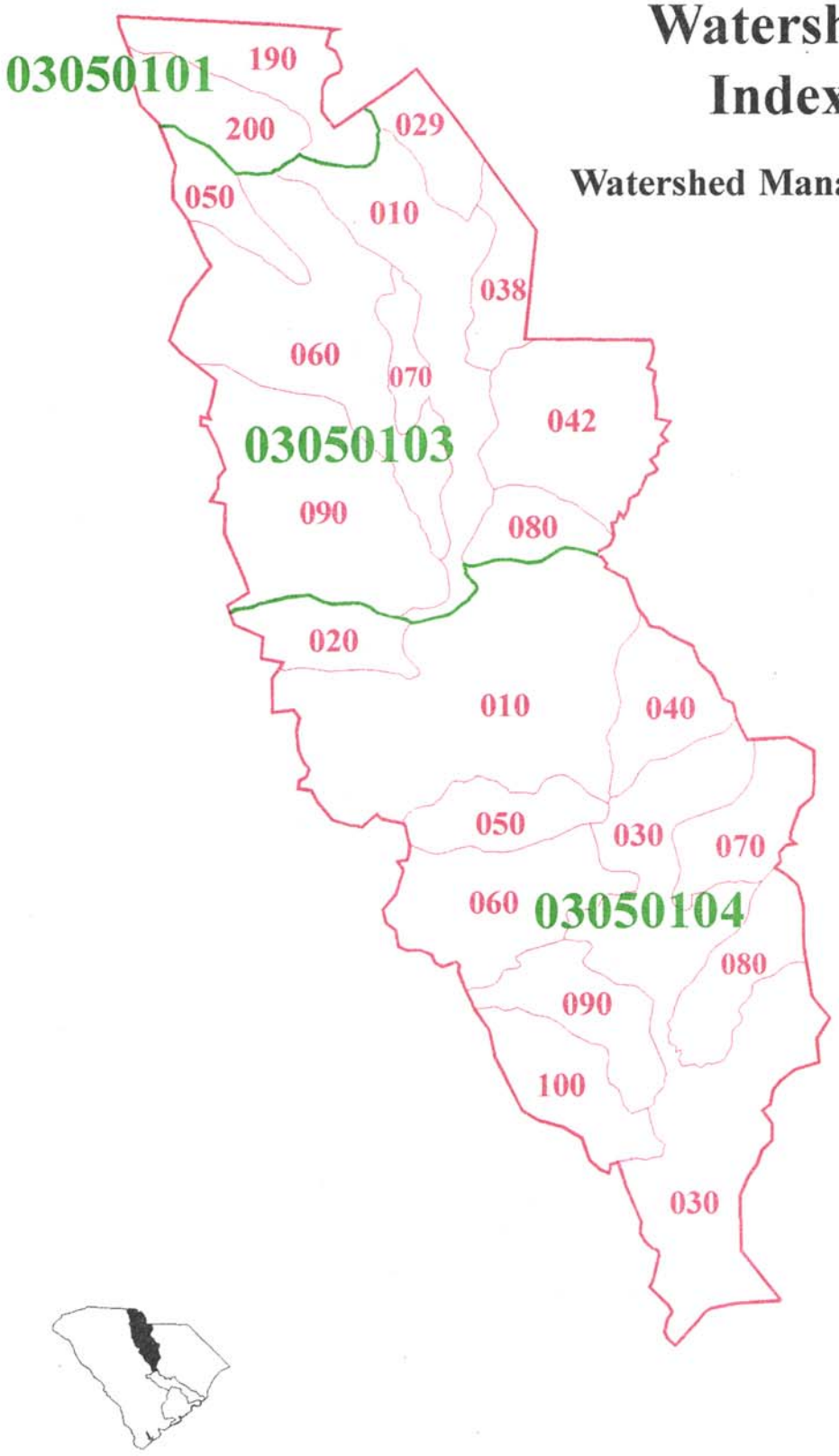
The Catawba River enters the State of South Carolina through Lake Wylie, which extends across the State boundary near Charlotte, North Carolina. Allison Creek flows into the midlake region of Lake Wylie within South Carolina. The Catawba River flows out of Lake Wylie and is joined by Sugar Creek, Twelvemile Creek, and Cane Creek before draining into Fishing Creek Reservoir, Cedar Creek Reservoir, and Great Falls Reservoir. Tinkers Creek flows into Fishing Creek, which together with Rocky Creek, Camp Creek, and Cedar Creek drains into Cedar Creek Reservoir. The Catawba River flows out of Cedar Creek Reservoir and joins Big Wateree Creek to forms the Wateree River, which flows through Wateree Lake. Grannies Quarter Creek and Sawneys Creek flow into the Wateree River downstream of Wateree Lake. Twentyfive Mile Creek and Big Pine Tree Creek enter the river near the City of Camden, followed by Swift Creek, Spears Creek, and Colonels Creek before merging with the Congaree River Basin to form the Santee River Basin.

Climate

Normal yearly rainfall in the WMU-0301 area is 45.95 inches, according to the S.C. historic climatological record (SCWRC 1990). Data compiled from National Weather Service stations in Chester, Winnsboro, Winthrop College, Camden, Catawba, Great Falls, Wateree Dam, Fort Mill, and Tilghman for Nursery were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the summer with 13.64 inches; 9.26, 11.19, and 11.86 inches of rain falling in the fall, winter, and spring, respectively. The average annual daily temperature is 61.7°F. Summer temperatures average 78.1°F and fall, winter, and spring temperatures are 62.6°F, 44.4°F, and 61.6°F, respectively.

Watershed Unit Index Map

Watershed Management Unit 0301



SCDHEC-EQC, 1995

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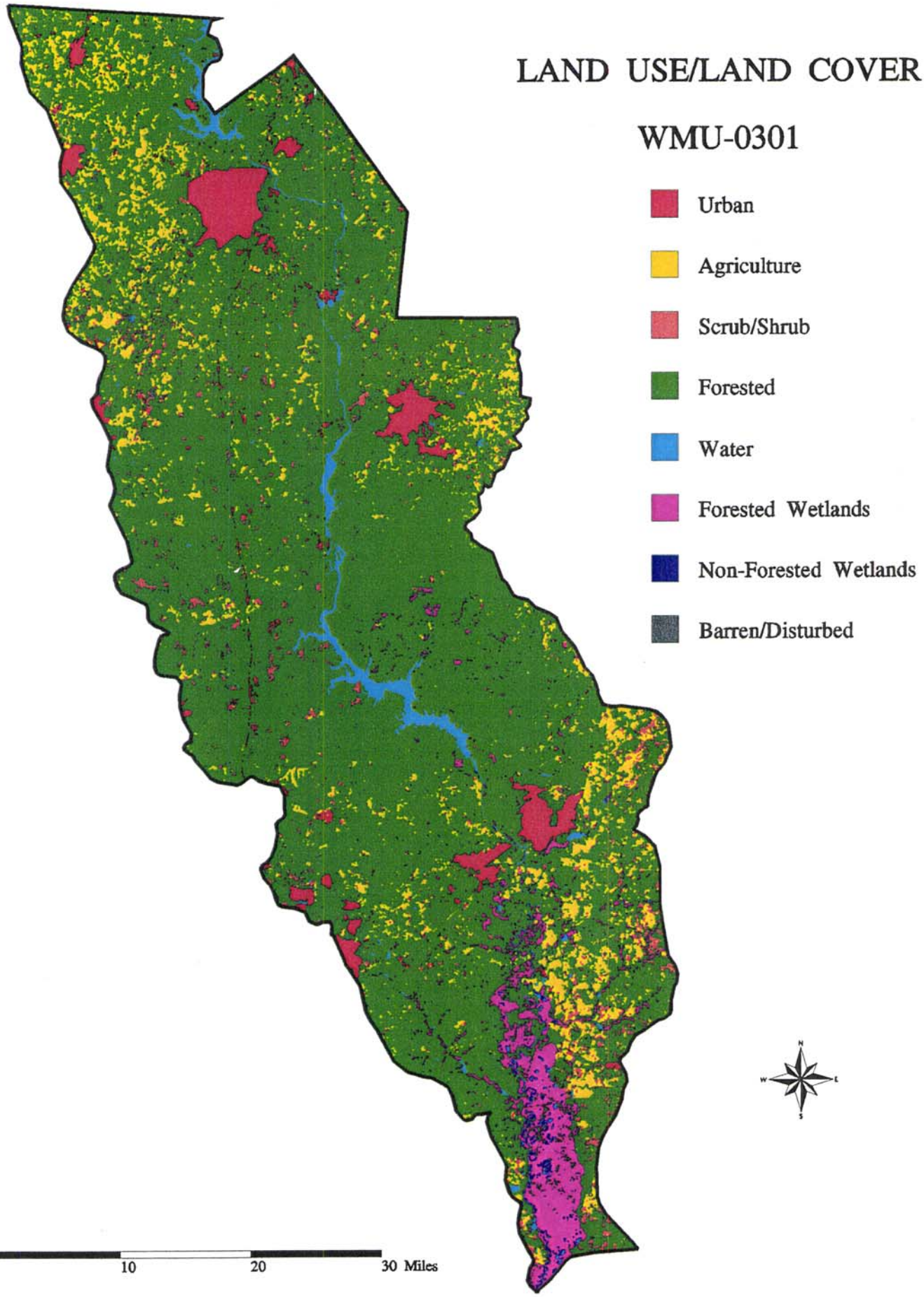
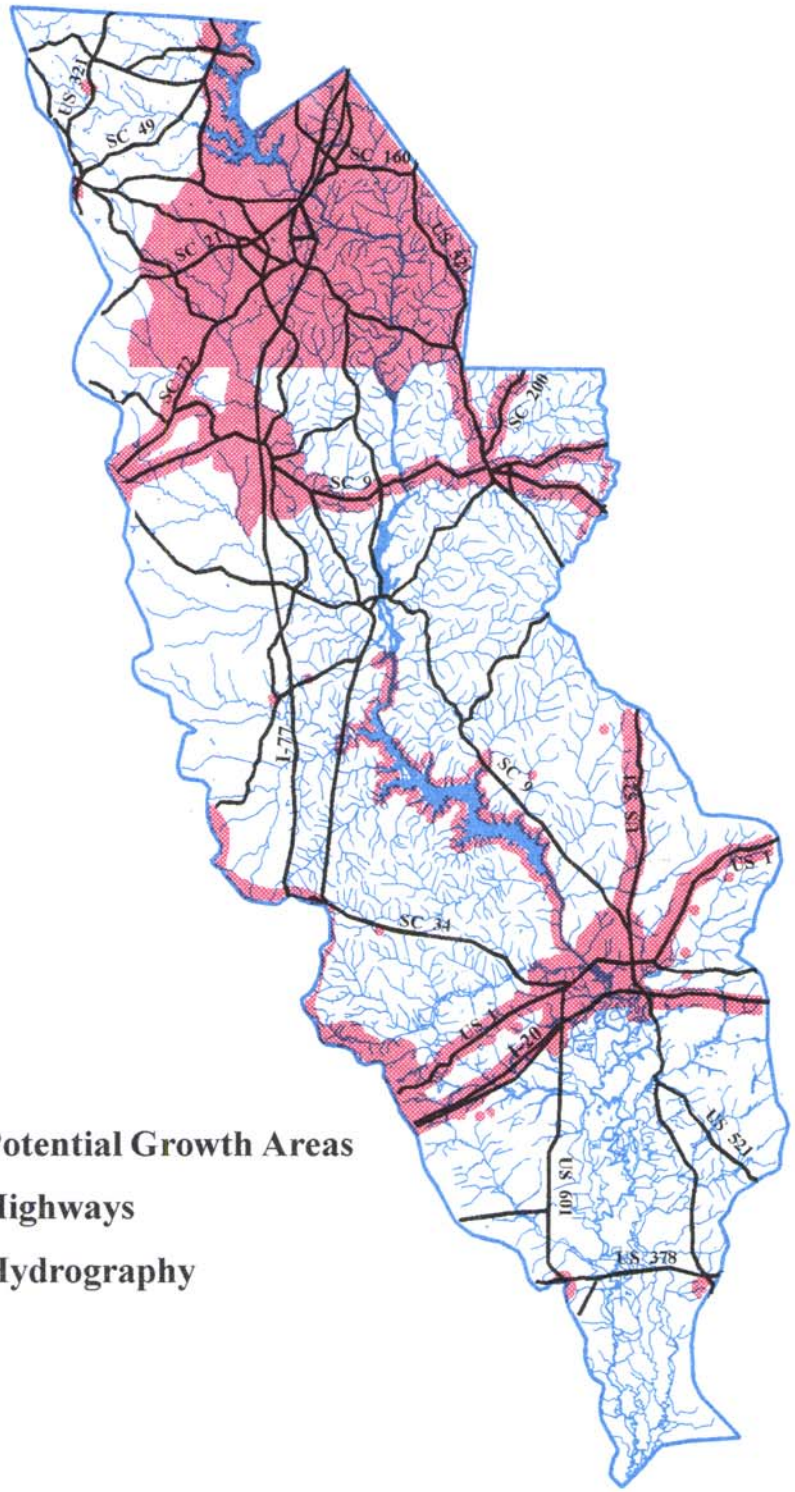
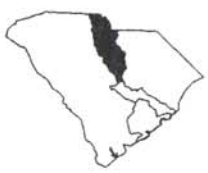


Source: Spot Satellite Imagery 89-90
SCDNR - LRC

Potential Growth Areas

Watershed Management Unit 0301





SCDHEC-EQC, 1995

0 5 10 15 20 MILES

03050101-190

(Catawba River)

General Description

Watershed 03050101-190 is located in York County and consists primarily of the ***Catawba River*** and its tributaries. The watershed occupies 49,972 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Goldston-Badin series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 3.81% urban land, 12.30% agricultural land, 9.23% scrub/shrub land, 1.34% barren land, 62.29% forested land, and 11.03% water.

The Catawba River originates in North Carolina and flows through Lake Wylie over into South Carolina in this watershed. Lake Wylie is used for both power generation and recreation. Tributaries draining into and forming arms of Lake Wylie include Catawba Creek, Mill Creek, Crowders Creek (South Fork Crowders Creek, Rocky Branch, Brown Creek, Beaverdam Creek, Camp Run), Torrence Branch, and Johnnytown Branch. There are a total of 168.8 stream miles in this watershed, all classified FW.

Water Quality

Lake Wylie - Categorized as a major lake, Lake Wylie has a watershed covering 297.9 km^2 in South Carolina (the majority of the watershed is in North Carolina), a surface area of 5040.5 hectares, and a maximum and mean depth of 28.4m and 6.9m, respectively. The retention time for the lake is 39 days. There are no impaired recreational usages of the lake. A single Algal Growth Potential Test, conducted in the summer of 1989, indicates the limiting nutrients are nitrogen and phosphorus in the lake's Crowders Creek arm and nitrogen in the Allison Creek arm. Eutrophication studies classify the Buster Boyd Bridge and the dam area of Lake Wylie as Category I for excessive nutrients with extremely high productivity, and further study is recommended. Similar studies classify the Allison Creek and Crowders Creek arms as Category II for intermediate trophic condition, which could be susceptible to further degradation. The lake water quality trend data from 1980-1993 indicates that the Crowders Creek arm site has improved from its previous Category I classification.

There are six SCDHEC monitoring sites within the S.C. portion of Lake Wylie. Excursions of pH occurred; however, higher levels occur naturally in lakes with significant phytoplankton communities and are considered natural, not standards violations. Recreational uses are fully supported at all six sites. Aquatic life uses may not be supported above the Mill Creek arm (CW-197), due to a high concentration of copper and a very high concentration of zinc measured in the water column in 1991. This is compounded by a significantly decreasing trend in dissolved oxygen; however, significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. In 1989 sediment samples, high concentrations of chromium and zinc, and a very high concentration of copper were measured, along

with PCB-1254. In 1990 and 1992, high concentrations of chromium and very high concentrations of copper and zinc were measured in sediment and in 1993, very high concentrations of chromium, copper, nickel, and zinc were measured.

In the Crowders Creek embayment (CW-027), aquatic life uses are threatened by a significantly decreasing trend in dissolved oxygen; however, a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions. Pesticides (P,P'DDT, P,P'DDD, and Endrin) were detected in sediment in 1990. Although the use of DDT was banned in 1973, it is very persistent in the environment. Lead was high in 1991 sediments, and high concentrations of copper and zinc were measured in 1993. The pesticides aldrin and parathion, and hexachlorobenzene (fungicide) were measured in sediment in 1993. Further downstream in the Crowders Creek embayment (CW-245), aquatic life uses are fully supported.

Aquatic life uses are threatened at the mouth of the Crowders Creek embayment (CW-198), by a significantly decreasing trend in dissolved oxygen and a significantly increasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations together with a significantly decreasing trend in fecal coliform bacteria concentration suggest improving conditions. A very high concentration of copper and a high concentration of zinc were measured in the 1989 sediment sample, high concentrations of copper and zinc were measured in the 1990 sample, a very high concentration of copper and a high concentration of zinc were measured in the 1992 sample, and a high concentration of chromium and zinc, together with very high concentrations of copper and nickel were measured in the 1993 sediment sample.

Aquatic life uses are threatened near the Lakewoods subdivision (CW-201) by a significantly decreasing trend in dissolved oxygen, a significantly increasing trend in pH, a high concentration of zinc measured in water in 1990, and an elevated concentration of chromium measured in water in 1991. However, significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions. In sediment, a very high concentration of copper and zinc, a high concentration of chromium, and P,P'DDE (a metabolite of DDT) were measured in the 1989 sample. A very high concentration of copper and a high concentration of chromium and zinc were measured in the 1990 sediment sample, and a high concentration of copper was measured in the 1992 sediment sample. Aquatic life uses are fully supported at the site near the dam (CW-230).

Crowders Creek - There are three SCDHEC monitoring sites along Crowders Creek, which was Class B until April, 1992. Recreational uses are not supported at any site due to fecal coliform bacteria excursions under Class FW standards. Aquatic life uses may not be supported at the upstream site (in North Carolina) due to a very high concentration of zinc measured in water in 1993, and a high concentration of zinc measured in sediment in 1993. A significantly increasing trend in pH was also measured at this site. Further downstream, aquatic life uses may be only partially supported due to high concentrations of zinc measured in water in 1991 and 1993; however, a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. A significantly

increasing trend in pH was also noted at this site. Aquatic life uses are fully supported at the furthest downstream site.

South Fork Crowders Creek - Aquatic life uses are fully supported and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and turbidity indicate improving conditions. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Brown Creek - Aquatic life uses are fully supported for this creek, which was Class B until April, 1992. A significantly increasing trend in dissolved oxygen and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. Recreational uses are not supported at this station due to fecal coliform bacteria excursions under Class FW standards.

Beaverdam Creek - Aquatic life uses are fully supported for this creek, which was Class B until April, 1992. Bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. Recreational uses are not supported at this station due to fecal coliform bacteria excursions under Class FW standards.

Sanitary Bathing Areas

RECEIVING STREAM *BATHING SITE*	*PERMIT #* *STATUS*
LAKE WYLIE BOWATER	NO PERMIT ACTIVE
LAKE WYLIE EBENEZER PARK	46-17N ACTIVE
LAKE WYLIE JOSLIN PARK	46-02N ACTIVE
LAKE WYLIE BOAT LANDING	NO PERMIT ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

The Catawba River is included on the §304(l) long list of impacted waterbodies due to concerns for ambient toxicity. Crowders Creek is included on the §303(d) high priority list of waters targeted for TMDL development in relation to fecal coliform concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
LAKE WYLIE NORTH LAKE WYLIE WWTP PIPE #: 001 FLOW: 0.50	PROPOSED MINOR COMMUNITY EFFLUENT
LAKE WYLIE DUKE POWER CO./CATAWBA NUC STA PIPE #: 001 FLOW: 0.038 PIPE #: 002 FLOW: 83.00 PIPE #: 003 FLOW: 0.76 PIPE #: 004,005 FLOW: M/R	SC0004278 MAJOR INDUSTRIAL EFFLUENT
LAKE WYLIE RIVER HILLS PLANTATION/CWS PIPE #: 001 FLOW: 0.500 TO BE ELIMINATED	SC0026298 MINOR COMMUNITY EFFLUENT
LAKE WYLIE TEGA CAY #2 WWTP PIPE #: 001 FLOW: 0.320	SC0026743 MINOR COMMUNITY EFFLUENT
LAKE WYLIE TEGA CAY #3 WWTP PIPE #: 001 FLOW: 0.290 PIPE #: 002 FLOW: 1.00	SC0026751 MINOR COMMUNITY EFFLUENT EFFLUENT
BEAVERDAM CREEK BEAVER CREEK MHP PIPE #: 001 FLOW: 0.015 WQL FOR NH3-N, TRC	SC0032662 MINOR COMMUNITY WATER QUALITY
BEAVERDAM CREEK PHARR YARNS INC. PIPE #: 001 FLOW: 0.014 PIPE #: 002,003 FLOW: M/R WQL FOR TRC	SC0028321 MINOR INDUSTRIAL WATER QUALITY
BEAVERDAM CREEK DOVER YARNS INC./CLOVER PLANT PIPE #: 001 FLOW: M/R WQL FOR BOD5	SC0045209 MINOR INDUSTRIAL WATER QUALITY
MILL CREEK LAKE WYLIE MHP PIPE #: 001 FLOW: 0.09 WQL FOR BOD_5, NH3-N, TRC	SC0037605 MINOR COMMUNITY WATER QUALITY

Nonpoint Source Contributions

Lake Wylie is included on the §319 list of waters targeted for implementation action and the §303(d) low priority list of waters that may require TMDL development in relation to nonpoint source concerns. Beaverdam Creek and Crowders Creek are included on the §319 list as waters impacted by agricultural activities, and are both included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants. Water samples collected by the Department from Beaverdam Creek indicate elevated fecal coliform levels on numerous occasions. Computer modeling indicates a high potential for NPS problems from agricultural activities for this stream. Crowders Creek is included on the §319 list of waters targeted for further evaluation due to unknown North Carolina sources. Water samples from this stream indicate elevated levels of fecal coliform on numerous occasions and scattered elevated levels of toxic materials (zinc).

Landfill Activities

There are six active unpermitted landfills in the watershed in addition to those listed below.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
DUKE POWER CO. INDUSTRIAL	IWP-192 ACTIVE
UNNAMED CONSTRUCTION	CWP-017 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME* *COMMENTS*	*PERMIT #* *MINERAL*
MCCALL GRADING COMPANY, INC. MCCALL MINE	0926-46 GRAVEL

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
CITY OF ROCK HILL (M)	LAKE WYLIE	7.67
CATAWBA NUCLEAR STA. (I)	LAKE WYLIE	0.23

Growth Potential

Residential development along the frontage of Lake Wylie continues to increase, with densest areas located around Tega Cay, River Hills, and the lake shore north of Rock Hill. Residential development away from the lake is scattered, except in the Town of Clover. Commercial development continues to occur in the Lake Wylie Community along S.C. Highway 49. Another major land use factor is the Catawba Nuclear Station on the west side of the lake. Transportation projects which will have an impact on future growth include the widening of the Buster Boyd Bridge

and S.C. Highway 49, both of which will provide improved access into the Charlotte urban area and encourage further residential and commercial growth along the western shore of the lake.

Several utility projects are underway. The River Hills development and surrounding areas have previously been served by wells and package treatment plants. Agreements have recently been reached which will result in water and sewer service being provided to the area from the City of York to the City of Rock Hill. This will reduce the discharge of effluent into the lake, but it will also encourage more dense development along the lake frontage. The extension of lines will also allow most of the frontage in South Carolina to be served with public sewer over the next few years, and gradually eliminating hundreds of septic tanks. The City of Tega Cay and River Hills Plantation will also eliminate package treatment plants in the near future and receive sewage treatment from York County/Fort Mill. In contrast to the high density development expected along the lake frontage, the western sections of the watershed should continue to have a rural residential character.

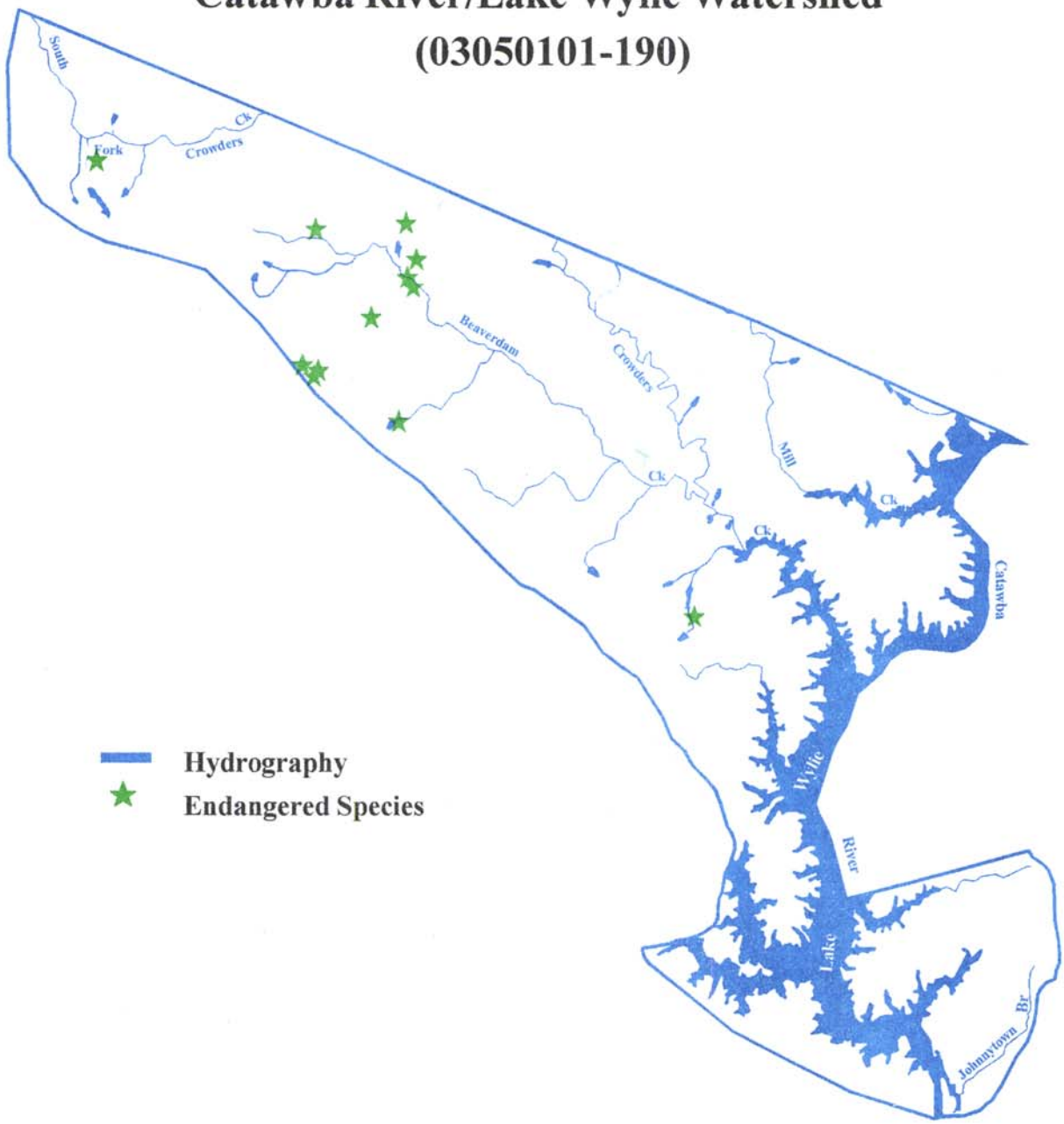
Implementation Strategy

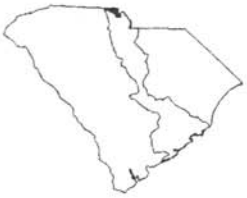
Aquatic life uses for the Mill Creek arm of Lake Wylie are impaired due to elevated levels of copper and zinc, and low dissolved oxygen concentrations resulting from North Carolina point and nonpoint sources. Crowders Creek also has impaired aquatic life uses in the form of elevated zinc from North Carolina contributions. Recommendations from a joint N.C.-S.C. study aimed to prevent further enrichment of Lake Wylie include: no new dischargers to lake system unless it is found to be the most environmentally sound alternative, any new dischargers allowed under these conditions should be required to use state-of-the-art nutrient removal technology; existing dischargers should be removed as alternatives become available; and no expansion should be allowed that would increase the nutrient load from a facility, all other expansions should require state-of-the-art nutrient removal technology.

Recreational uses are impaired for Crowders Creek, South Fork Crowders Creek, Brown Creek, and Beaverdam Creek due to elevated fecal coliform bacteria concentrations from nonpoint sources. Crowders Creek is included on the NPS Task Force's High Priority List, and a cooperative study between North and South Carolina is recommended to identify and resolve the fecal coliform problem. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments of South Fork Crowders Creek, Brown Creek, and Beaverdam Creek and recommend solutions to correct the problems. Beaverdam Creek's fecal coliform condition is also point source related. The permits for these dischargers are being revised and the bacterial condition is expected to improve with the new NPDES permit limits.

Natural Resources

Catawba River/Lake Wylie Watershed
(03050101-190)





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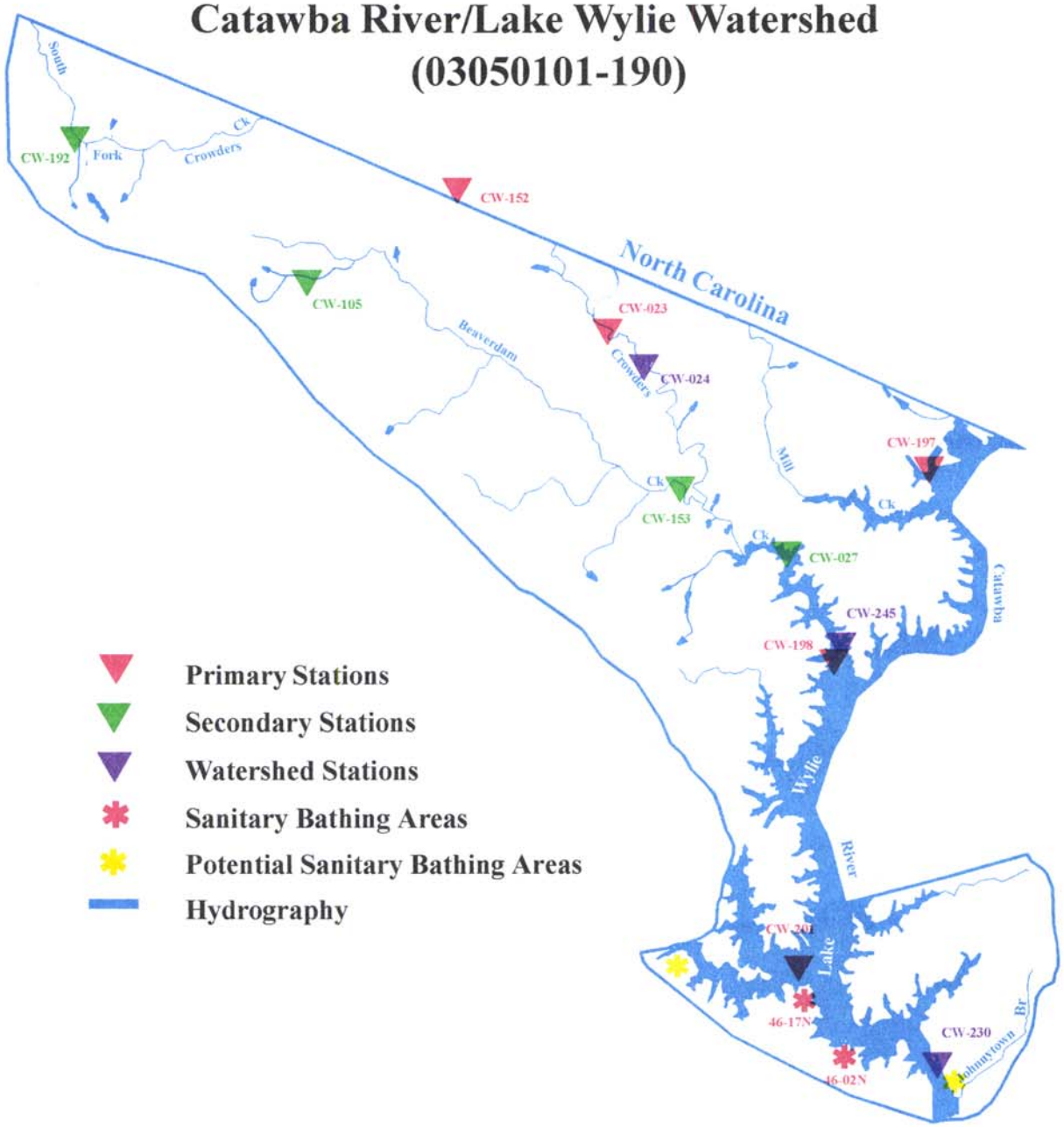
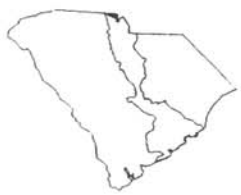
SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Catawba River/Lake Wylie Watershed
(03050101-190)





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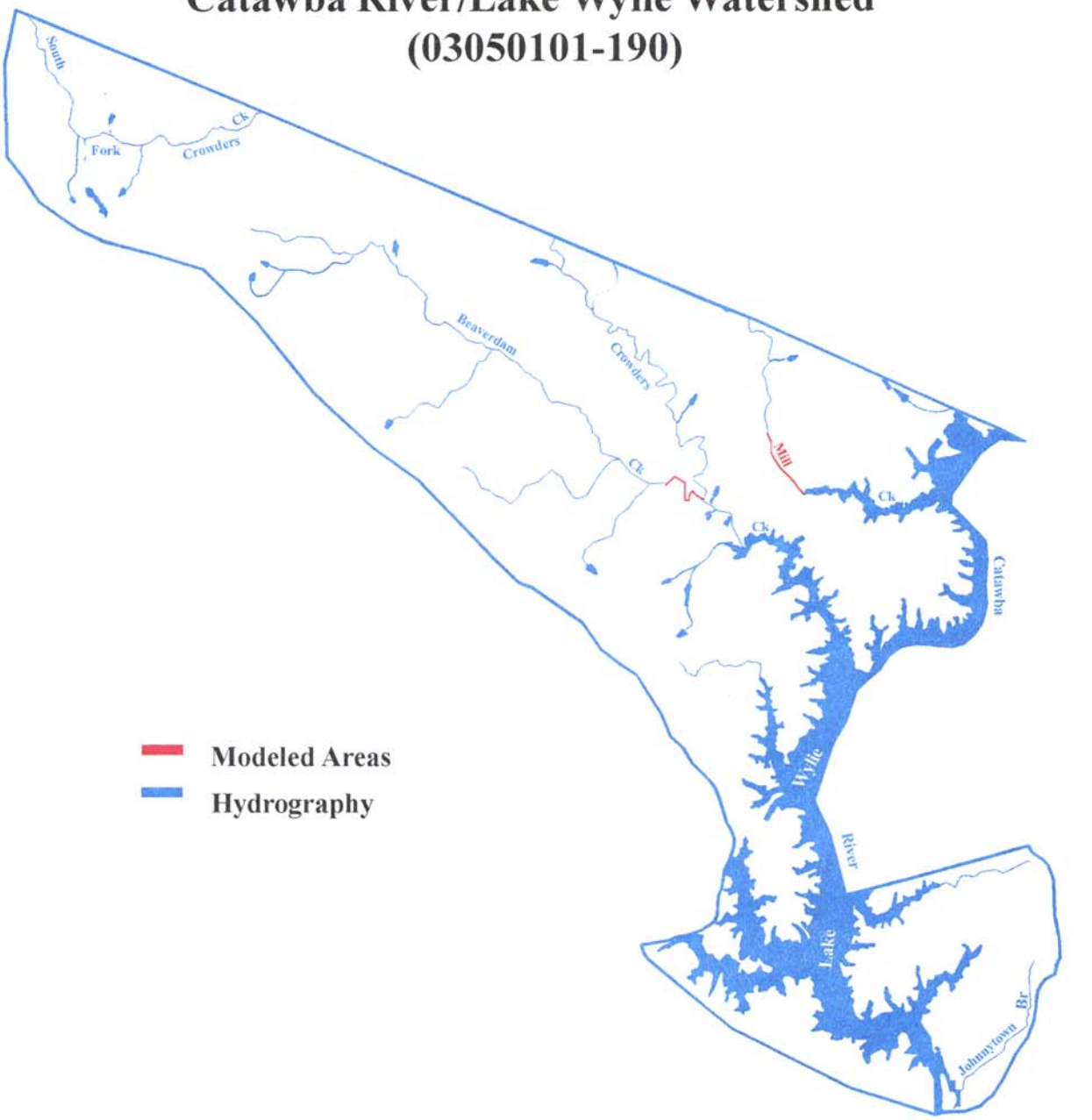
SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Catawba River/Lake Wylie Watershed
(03050101-190)



SCDHEC-EQC, 1995

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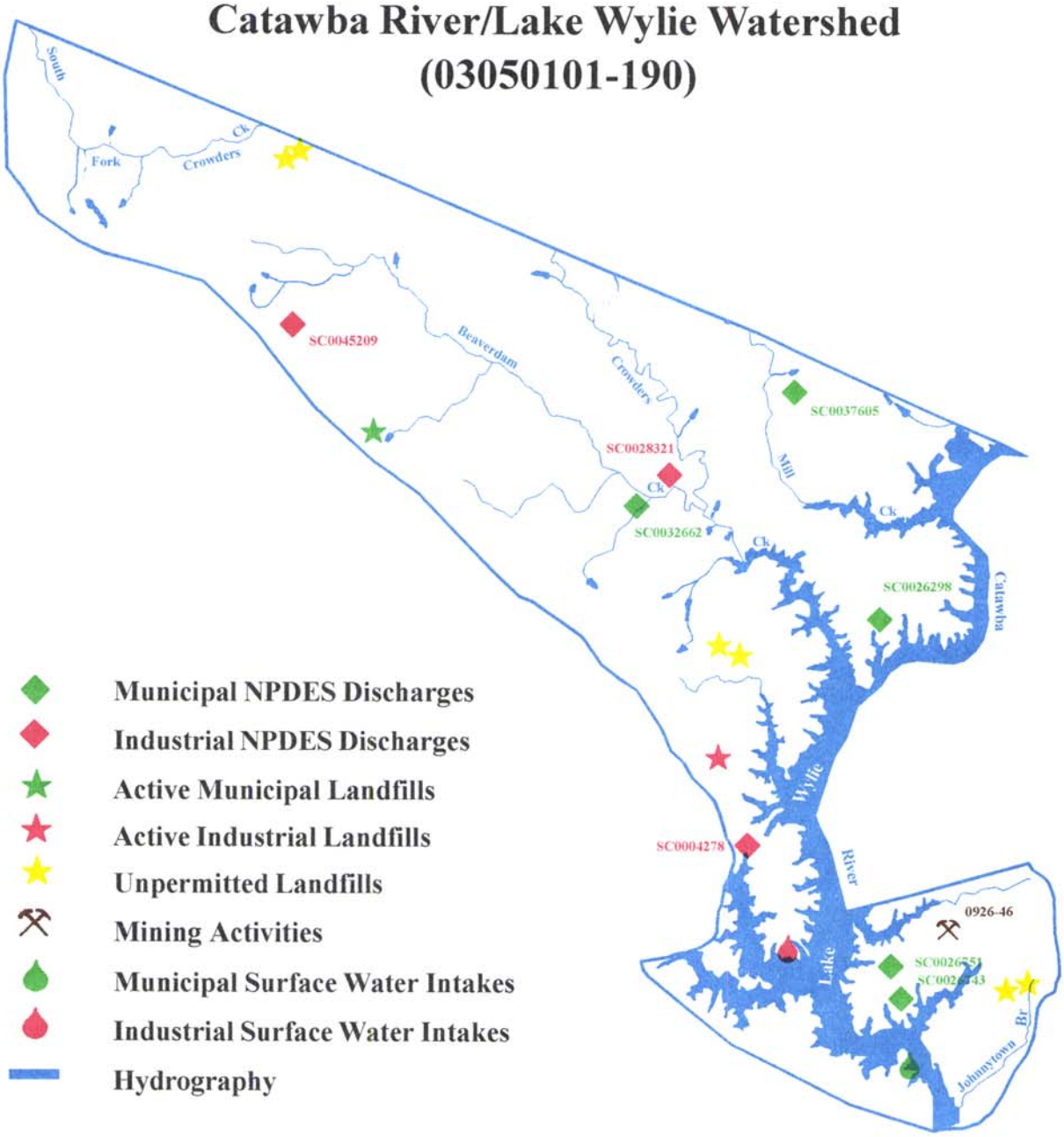
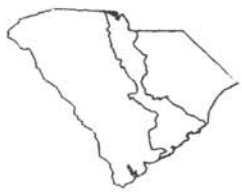
Activities Potentially Affecting Water Quality

Catawba River/Lake Wylie Watershed
(03050101-190)





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SCDHEC-EQC, 1995

03050101-200

(Allison Creek)

General Description

Watershed 03050101-200 is located in York County and consists primarily of ***Allison Creek*** and its tributaries. The watershed occupies 40,742 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 1.74% urban land, 22.51% agricultural land, 14.37% scrub/shrub land, 1.27% barren land, 58.28% forested land, and 1.83% water.

Allison Creek originates near the Town of Clover and is joined by Morris Branch, Calabash Branch (Walker Branch), Grist Branch, Johnson Branch (Rock Branch), and Big Branch before forming an arm of Lake Wylie near the City of York. Little Allison Creek is also impounded and flows into the Allison Creek arm of the lake. There are a total of 65.2 stream miles in this watershed, all classified FW.

Water Quality

Allison Creek - Aquatic life uses are fully supported at this creek, which was Class B until April, 1992. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions. Recreational uses are not supported at this site due to fecal coliform bacteria excursions under Class FW standards, but a statistically significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions.

Calabash Branch - Aquatic life uses are fully supported at this site. This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. A significantly increasing trend in pH was also noted at this site. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Allison Creek Arm of Lake Wylie - Aquatic life and recreational uses are fully supported. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions.

Activities Potentially Affecting Water Quality

Point Source Contributions

Calabash Branch is included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic and non-§307(a) toxic pollutants.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
ALLISON CREEK SIEBE NORTH INC. PIPE #: 001 FLOW: 0.012 WQL FOR BOD_5, NH3-N, TRC, DO	SC0002801 MINOR INDUSTRIAL WATER QUALITY
CALABASH BRANCH TOWN OF CLOVER PIPE #: 001 FLOW: 0.62 WQL FOR BOD_5, NH3-N, TRC, DO	SC0020303 MINOR MUNICIPAL WATER QUALITY

Mining Activities

MINING COMPANY *MINE NAME* *COMMENTS*	*PERMIT #* *MINERAL*
BLYTHE CONSTRUCTION, INC. ALLISON CREEK SAND PIT INSTREAM DREDGING	0571-46 SAND

Growth Potential

The majority of this watershed is rural in nature; however, portions of the Town of Clover and areas fronting and near Lake Wylie have existing concentrated development. There are also a few areas of intensive farming. Water and sewer services are available in the immediate vicinity of Clover, and water has recently been extended along S.C. Highway 274 near Lake Wylie. Future growth trends should show continued residential development on Lake Wylie, continued expansion around Clover, and limited low density residential growth scattered throughout the rural areas. The Town of Clover is considering eliminating its discharge and tying in with the City of Gastonia, N.C.

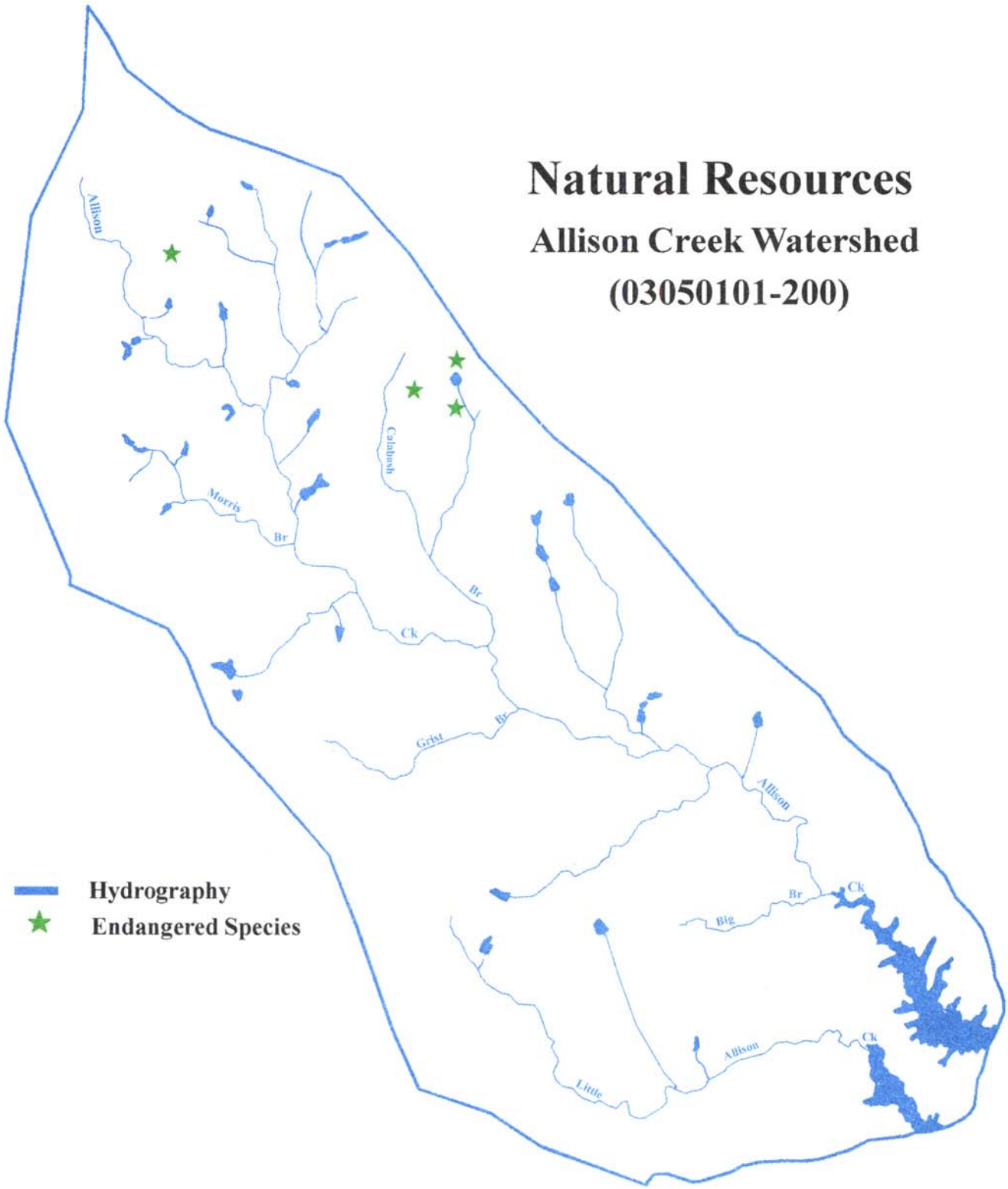
Implementation Strategy

Recreational uses are impaired for both Allison Creek and Calabash Creek due to elevated fecal coliform concentrations. Allison Creek's bacterial condition is nonpoint source related and the Department's Watershed Implementation Staff will determine, if possible, the source of the bacteria and recommend solutions to correct the problem. Calabash Creek's bacterial condition is primarily point source related. The permit for this discharger is being revised and the bacterial condition is expected to improve with the new NPDES permit limits.

Natural Resources

Allison Creek Watershed

(03050101-200)



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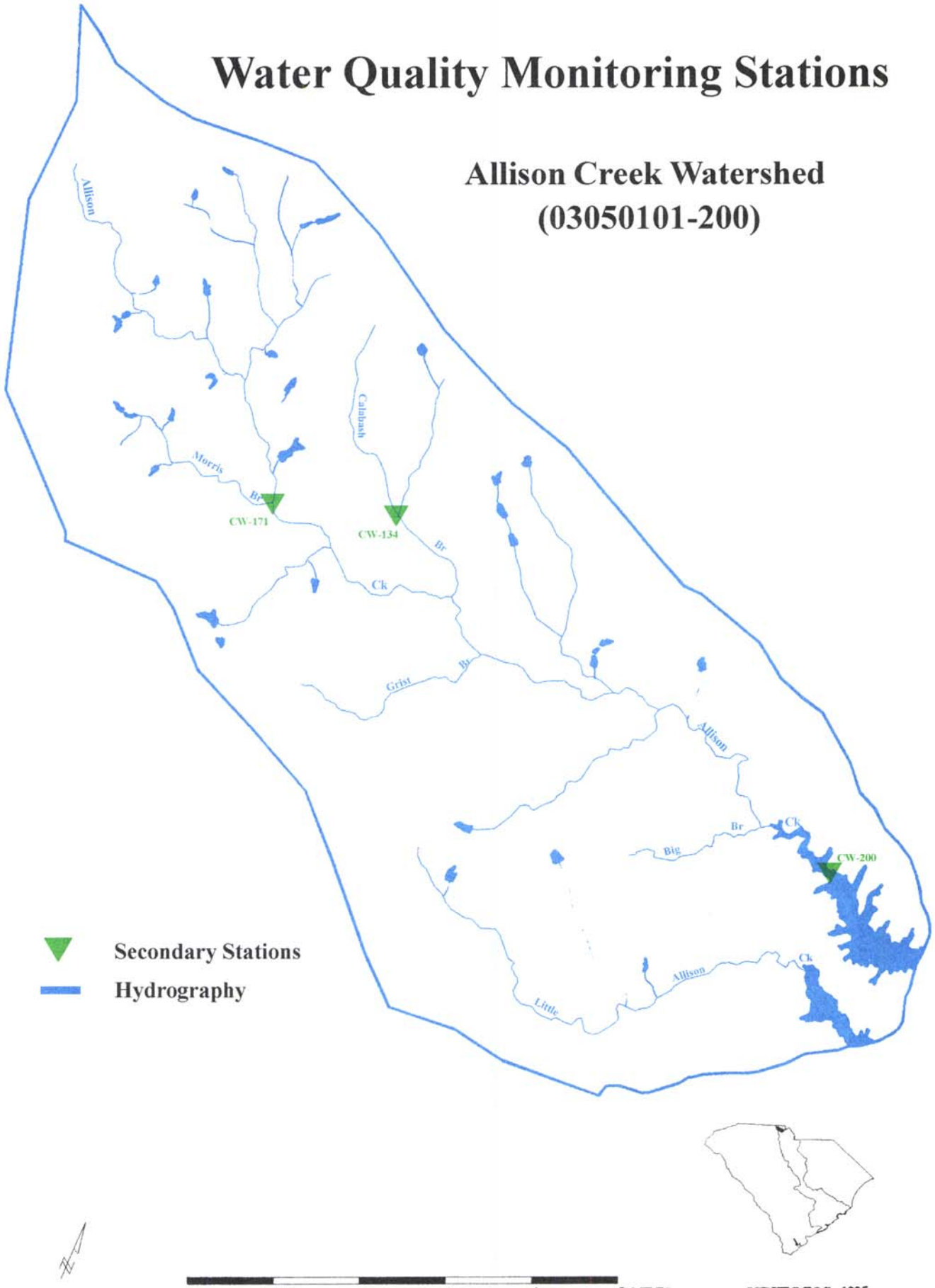
SCDHEC-EQC, 1995

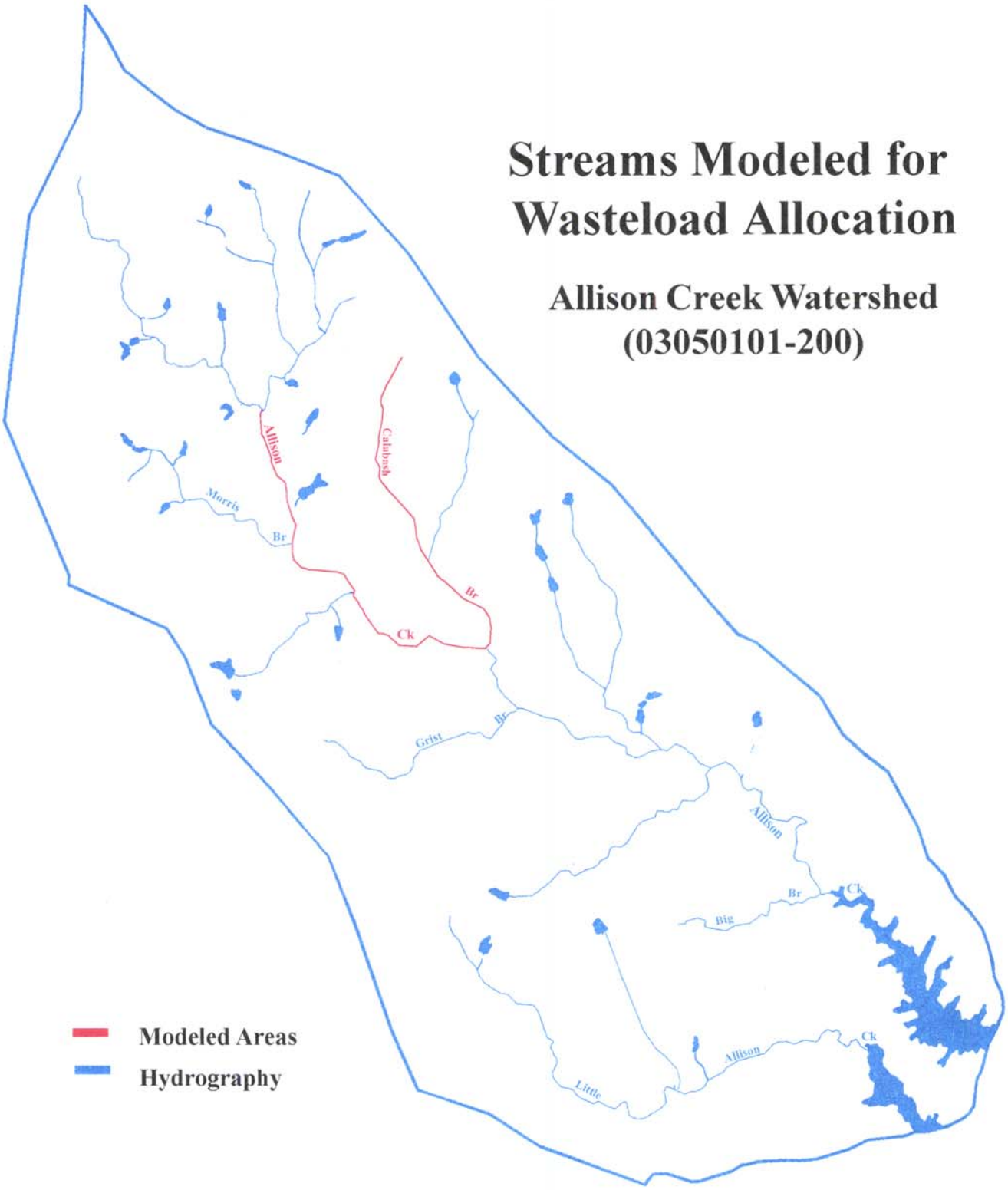
Water Quality Monitoring Stations

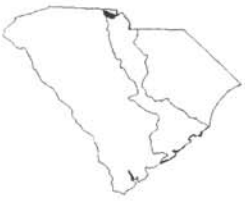
Allison Creek Watershed
(03050101-200)



Streams Modeled for Wasteload Allocation

Allison Creek Watershed (03050101-200)



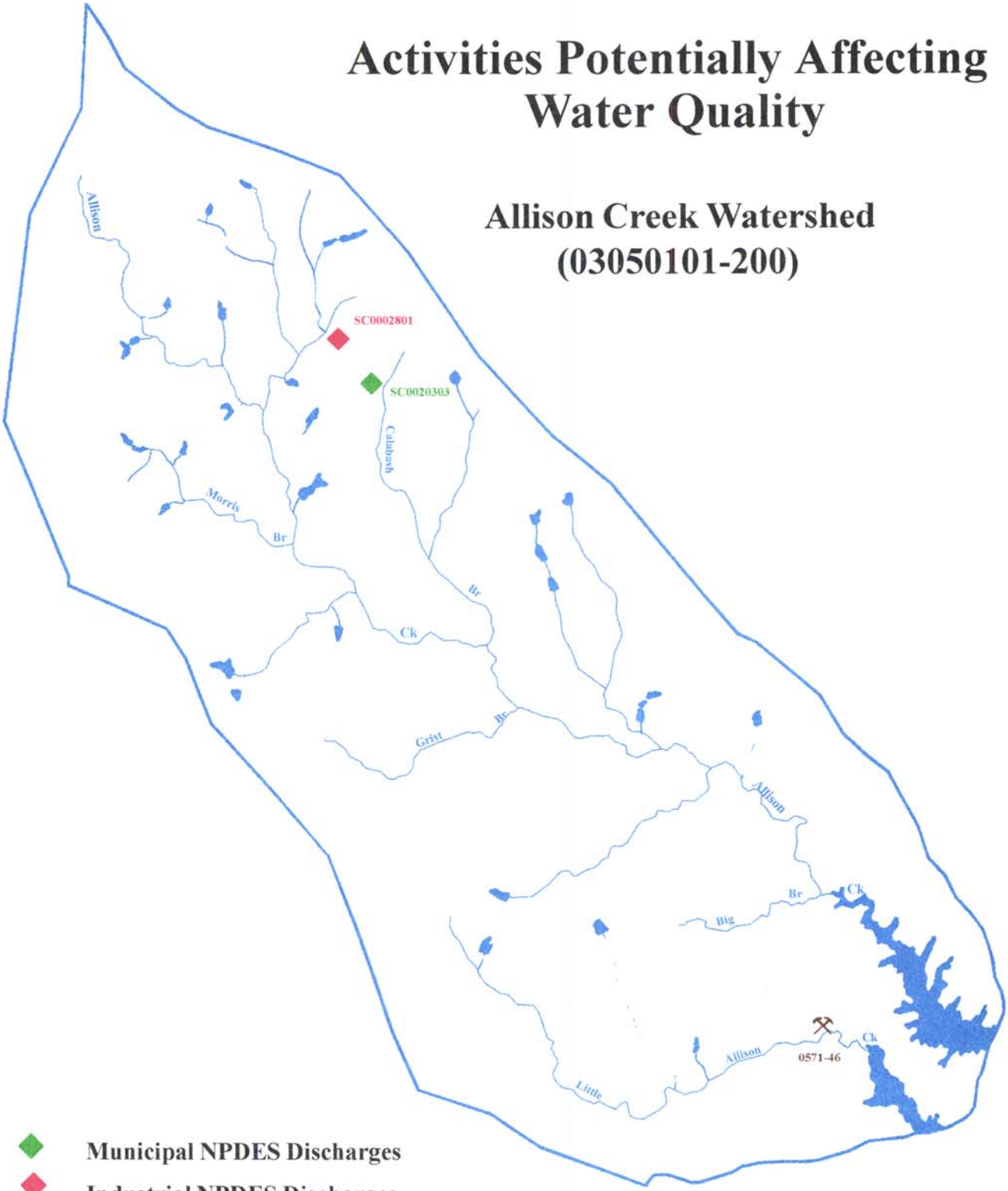


0 1 2 3 4 5 MILES

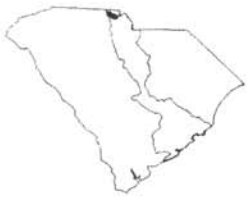
SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality

Allison Creek Watershed (03050101-200)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Mining Activities
- Hydrography



0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

03050103-010

(Catawba River)

General Description

Watershed 03050103-010 is located in York and Chester Counties and consists primarily of the ***Catawba River*** and its tributaries through to the Cedar Creek Dam. The watershed occupies 28,655 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes-Herndon-Helena-Georgeville series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 12.85% urban land, 6.98% agricultural land, 4.53% scrub/shrub land, 0.65% barren land, 68.14% forested land, and 6.85% water.

The Catawba River flows through the Catawba Dam on Lake Wylie (03050101-190) near the Town of Fort Mill, and is joined by Big Dutchman Creek (Little Dutchman Creek), Dye Branch (Jones Branch), Manchester Creek, and Burgis Creek (all originating near the City of Rock Hill) before accepting drainage from the Sugar Creek watershed (03050103-028). Downstream from the Sugar Creek drainage, the Catawba River flows pass the Catawba Indian Reservation and is joined by Haggins Branch, Sixmile Creek (Barber Creek), Ferry Branch, Abernathy Creek, Greene Creek, and the Twelvemile Creek watershed (03050103-038). The Landsford Canal connects the bend in the river where Twelvemile Creek enters. Further downstream, the river accepts the drainage of Rock Water Spring Branch, Dunn Creek, and the Cane Creek watershed (03050103-042) near the Town of Fort Lawn. The Catawba River then flows into Fishing Creek Reservoir, which is impounded by the Fishing Creek Dam. Bear Creek forms an arm of the reservoir.

The Catawba River is dammed again just downstream of the Fishing Creek Dam and the flow diverted to form Great Falls Reservoir. The retention time for Great Falls Reservoir is approximately one day, and essentially functions as an expanded area of the diverted Catawba River. The Fishing Creek watershed (03050103-060) drains into Great Falls Reservoir just below the Fishing Creek Dam. Great Falls Reservoir is impounded by the Dearborn Dam, and together with the Cedar Creek Dam downstream serve to back the water up into the true Catawba River bed to form Cedar Creek Reservoir. The section of the Catawba River upstream of Cedar Creek Reservoir and downstream of the Catawba River Diversion Dam is dry and serves as an emergency spillway. Great Falls Reservoir also has a dam between it and this dry section used for periods of flood. The Camp Creek watershed (03050103-080) drains into this section and forms a ponded area.

The Rocky Creek watershed (03050103-090) drains into the section of Cedar Creek Reservoir between the Dearborn Dam and the Cedar Creek Dam. Debutary Creek drains into and forms an arm of Cedar Creek Reservoir just above the Cedar Creek Dam. Duke Power Company oversees the operation of these reservoirs, and they are used for power generation as well as recreation. Fishing Creek Reservoir is also used for water supply. There are numerous small recreational lakes and ponds in this watershed (15-110 acres), and a total of 248.8 stream miles, all classified FW.

Water Quality

Catawba River - There are four SCDHEC monitoring sites along this portion of the Catawba River, which was Class B until April, 1992. Recreational uses are fully supported at all five sites. Aquatic life uses are only partially supported at the furthest upstream site (CW-014) due to dissolved oxygen excursions, compounded by a high concentration of zinc measured in 1993. The dissolved oxygen excursions are most likely related to the hypolimnetic releases from the Lake Wylie Dam located approximately three miles upstream.

Further downstream, aquatic life uses are fully supported at station CW-041, and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions. A significant increasing trend in pH was also noted. A significantly decreasing trend in fecal coliform bacteria concentration also suggests improving conditions. In the 1989 sediment sample, very high concentrations of copper and zinc were measured, together with the detection of PCB-1260.

Aquatic life uses are also fully supported at CW-016, but may be threatened by a significantly decreasing trend in dissolved oxygen and an increasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions, as does a significantly decreasing trend in fecal coliform bacteria concentration. A high concentration of zinc was measured in water in 1991.

Immediately below the Great Falls Reservoir Dam (CW-174), aquatic life uses are only partially supported due to dissolved oxygen excursions. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations; however, dam operations are most likely an additional contributing factor. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. Although fully supported, recreational uses may be threatened at this site by a significantly increasing trend in fecal coliform bacteria concentration.

Catawba River Trib - Aquatic life uses may not be supported due to very high concentrations of zinc and copper measured in water in 1989. This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Fishing Creek Reservoir - Categorized as a major lake, Fishing Creek Reservoir has a watershed covering 820.3 km^2 within South Carolina (up to the Lake Wyle Dam), a surface area of 1363.8 hectares, and a maximum and mean depth of 27.3m and 7.2m, respectively. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrient in the lake system was nitrogen. Eutrophication studies classified the headwaters and dam area of Fishing Creek Reservoir as Category I for excessive nutrients and extremely high productivity. This reservoir is

recommended for watershed management of point and nonpoint sources. The short retention time of Fishing Creek Reservoir (6 days) restricts algal growth.

There are two SCDHEC monitoring sites within Fishing Creek Reservoir. Recreational uses are fully supported at both sites and significantly decreasing trends in fecal coliform bacteria concentration at both sites suggest improving conditions. Aquatic life uses are fully supported at the upstream site, but may be threatened by a significantly declining trend in dissolved oxygen concentration, and significantly increasing trends in pH and turbidity. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. High concentrations of copper and zinc were measured in the 1993 sediment sample.

Aquatic life uses are also fully supported at the downstream site near the dam, but may be threatened by a significantly increasing trend in pH and a high concentration of copper measured in water in 1989. Excursions of pH occurred; however, higher levels occur naturally in lakes with significant phytoplankton communities and are considered to be natural, not standards violations. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. In the 1989 sediment sample, a high concentration of chromium, and very high concentrations of copper and zinc were measured, together with PCB-1260. In the 1990 sediment sample, a high concentration of nickel and very high concentrations of chromium, copper, and zinc were measured. Very high concentrations of chromium, copper, and zinc were measured in both the 1992 and 1993 sediment samples. The 1993 sample also had a very high concentration of nickel.

Cedar Creek Reservoir - Categorized as a minor lake, Cedar Creek Reservoir has a watershed encompassing 1,468 km^2 (up to the Fishing Creek Reservoir Dam), a surface area of 323.8 hectares, and a maximum and mean depth of 10.7m and 8.8m, respectively. The retention time for the lake is only 2 days. There are no impaired recreational usages for either Fishing Creek or Cedar Creek Reservoirs. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrient in the lake system was nitrogen. Cedar Creek Reservoir is classified as Category I and is recommended for watershed management of point and nonpoint sources.

Sanitary Bathing Areas

RECEIVING STREAM *BATHING SITE*	*PERMIT #* *STATUS*
CATAWBA RIVER LANDSFORD CANAL PARK	NO PERMIT ACTIVE
CATAWBA RIVER BOAT LANDING (NEAR FT.LAWN)	NO PERMIT ACTIVE
FISHING CREEK RESERVOIR BOAT LANDING	NO PERMIT ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

The Catawba River is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform and turbidity concerns. The Catawba River is included on the §304(l) short list for waters not expected to meet applicable water quality standards after full implementation of NPDES permit conditions due, in part or entirely, to point source discharges of §307(a) toxics; Bowater Inc./Carolina Division was the facility discharging the toxic effluent (dioxin). A tributary to the Catawba River is included on the §303(d) low priority list for fecal coliform concerns, and Fishing Creek Reservoir and Cedar Creek Reservoir are included due to nutrient concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
CATAWBA RIVER BOWATER, INC. PIPE #: 01A,001,003,005 FLOW: M/R WQL FOR BOD_5, DO	SC0001015 MAJOR INDUSTRIAL WATER QUALITY
CATAWBA RIVER HOECHST CELANESE CORP. PIPE #: 001 FLOW: 3.69 WQL FOR NH3-N, TRC, DO	SC0001783 MAJOR INDUSTRIAL WATER QUALITY
CATAWBA RIVER HOECHST CELANESE CORP. PIPE #: 002 FLOW: 2.5 FLYASH LAGOON	SC0001783 MAJOR INDUSTRIAL EFFLUENT
CATAWBA RIVER HOECHST CELANESE CORP. PIPE #: 003 FLOW: 61.3 WQL FOR DO; NONCONTACT COOLING WATER	SC0001783 MAJOR INDUSTRIAL WATER QUALITY
CATAWBA RIVER SPRINGS IND./GRACE FINISHING PIPE #: 001,O01A FLOW: 11.135 PIPE #: 002 FLOW: M/R	SC0003255 MAJOR INDUSTRIAL EFFLUENT EFFLUENT
CATAWBA RIVER SPRINGS IND./GRACE FINISHING PIPE #: 003 FLOW: 6.28 WQL FOR DO, NH3-N	SC0003255 MAJOR INDUSTRIAL WATER QUALITY
CATAWBA RIVER CITY OF ROCK HILL/MANCHESTER CK PLT PIPE #: 001 FLOW: 20.0 WQL FOR BOD_5, NH3-N, TRC, DO	SC0020443 MAJOR MUNICIPAL WATER QUALITY

CATAWBA RIVER TOWN OF FORT MILL PIPE #: 001 FLOW: 1.5	SC0020371 MAJOR MUNICIPAL EFFLUENT
CATAWBA RIVER CITY OF LANCASTER/MAIN PLANT PIPE #: 001 FLOW: 7.5 WQL FOR NH3-N, DO; UNCONSTRUCTED	SC0046892 MAJOR MUNICIPAL WATER QUALITY
CATAWBA RIVER LANCASTER COUNTY PLAN. & DEV. COMM. PIPE #: 001 FLOW: 0.0053	SC0027391 MINOR INDUSTRIAL EFFLUENT
CATAWBA RIVER R-M INDUSTRIES INC. PIPE #: 001A FLOW: 0.672 PIPE #: 001B FLOW: 0.0065	SC0035360 MAJOR INDUSTRIAL EFFLUENT EFFLUENT
CATAWBA RIVER LANCASTER COUNTY/CATAWBA WATER PLT PIPE #: 001 FLOW: 0.698 UNCONSTRUCTED	SC0044598 MINOR INDUSTRIAL EFFLUENT
CATAWBA RIVER (CEDAR CK RES.) TOWN OF GREAT FALLS PIPE #: 001 FLOW: 1.4	SC0021211 MAJOR MUNICIPAL EFFLUENT
CATAWBA RIVER TRIB SPRINGS IND./WHITE PLANT PIPE #: 001 FLOW: 0.004 AIRWASH AND CHILLER WATER	SC0003280 MINOR INDUSTRIAL EFFLUENT
CATAWBA RIVER TRIB SPRINGS IND./FT LAWN COMPLEX PIPE #: 001 FLOW: 0.011 PIPE #: 002 FLOW: 0.011 PIPE #: 003 FLOW: 0.011	SC0003352 MINOR INDUSTRIAL EFFLUENT
BIG DUTCHMAN CREEK WOODFOREST SD PIPE #: 001 FLOW: 0.039 WQL FOR NH3-N, TRC, DO	SC0035661 MINOR COMMUNITY WATER QUALITY
MANCHESTER CREEK SUNOX INC. PIPE #: 001 FLOW: 0.013 WQL FOR BOD_5, DO	SC0039004 MINOR INDUSTRIAL WATER QUALITY
MANCHESTER CREEK SUNOX INC. PIPE #: 001A FLOW: .00075 WQL FOR TRC	SC0039004 MINOR INDUSTRIAL WATER QUALITY
MANCHESTER CREEK INLAND CONTAINER CORP. PIPE #: 001 FLOW: 0.024	SC0039250 MINOR INDUSTRIAL EFFLUENT

BURGIS CREEK TRIB QUAIL MEADOW PARK PIPE #: 001 FLOW: 0.025 WQL FOR BOD_5, NH3-N, TRC, DO	SC0028622 MINOR COMMUNITY WATER QUALITY
BARBER CREEK SHANDON SD/BLUE RIBBON UTIL. PIPE #: 001 FLOW: 0.014 WQL FOR NH3-N, TRC, DO	SC0027189 MINOR COMMUNITY WATER QUALITY
ABERNATHY CREEK CEDAR VALLEY MHP PIPE #: 001 FLOW: 0.03 WQL FOR NH3-N, TRC, DO	SC0032417 MINOR COMMUNITY WATER QUALITY
FISHING CREEK RESERVOIR REPUBLIC FASTENER PIPE #: 001 FLOW: M/R	SC0029572 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Contributions

The Catawba River and an unnamed tributary are included on the §319 high priority list of waters targeted for implementation action due to urban runoff. Department water samples indicate elevated fecal coliform and nutrient levels on numerous occasions, and scattered elevated levels of toxic materials (zinc, copper). Fishing Creek Reservoir is included on the §319 list as waters impacted by agricultural activities, and Department water samples indicate scattered fecal coliform excursions. The reservoir is also included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants.

Landfill Activities

There are six unpermitted landfills (three active, three closed) in this watershed in addition to those listed below.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
HOECHST CELANESE CORP. INDUSTRIAL	IWP-138 ACTIVE
BOWATER, INC. INDUSTRIAL	IWP-141 ACTIVE
SPRINGS IND. CONSTRUCTION	CWP-023 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
ASHE DIV., BORAL BRICKS,INC. YODER PIT #2	0523-29 CLAY

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
CHESTER METRO (M)	CATAWBA R.	2.58
SPRINGS IND.-GRACE BLEACHERY (M)	CATAWBA R.	10.07
SPRINGS IND.-GRACE BLEACHERY (I)	CATAWBA R.	20.00
CITY OF ROCK HILL (M)	CATAWBA R.	0.00
BOWATER, INC. (I)	CATAWBA R.	30.00
HOECHST CELANESE CORP. (M)	CATAWBA R.	3.65
HOECHST CELANESE CORP. (I)	CATAWBA R.	72.00
RM INDUSTRIES, INC. (I)	CATAWBA R.	1.08
CATAWBA WTP (M)	CATAWBA R.	4.95

Growth Potential

Portions of the Cities of Rock Hill and Fort Mill are included in the upper portion of the watershed, and are relatively densely developed. On the Fort Mill side of the Catawba River, there is a relatively wide floodplain which will limit development adjacent to the river. Water and sewer service is available to most of the area on this side of the river, which includes a large portion of the Town of Fort Mill and the residential area west of the town. Potential growth areas include expansion around Fort Mill and the commercial and industrial development around the I-77/S.C. Highway 160 interchange. On the Rock Hill side of the river, there is extensive residential development in the city and to the north, with other developed residential areas to the east in the Friendship and Lesslie communities. Industrial areas have developed to the east of Rock Hill, and the large Bowater paper mill complex is located to the south. Extension of a water line from Rock Hill to the Bowater Facility is underway, and this will provide opportunities for higher density development in the area.

Portions of the Towns of Fort Lawn and Great Falls are located in the lower portion of this watershed. There is a concentrated area of industrial development along S.C. Highway 9 between Fort Lawn and the City of Lancaster, and there is a limited residential development along the shoreline of Fishing Creek. There is public water and sewer service in the Towns of Fort Lawn and Great Falls and water along S.C. Highway 9 and portions of U.S. Highway 21, but growth prospects are limited. Preliminary discussions are being held among area governments concerning a possible regional sewer facility to be located on the Catawba River.

Several factors will influence future development in the watershed. The presence of I-77 provides excellent access to the Charlotte urban area, encouraging residential, industrial, distribution, and commercial development. The proposed Dave Lyle Boulevard Extension will be built across the watershed and into Lancaster County, opening up large areas with good access to Rock Hill and I-77. The Rock Hill Economic Development Corporation is currently developing a major business park between I-77 and the Catawba River. Waterford will include areas for office, manufacturing, distribution, and residential uses, and will have an 18-hole golf course. Another factor in the growth potential is the presence of the Catawba Indian Nation. The recent settlement of the Catawba's land claim will provide funds for major improvements in the reservation area. The reservation area will be expanded, utilities will be extended, and economic development activities will be undertaken. The

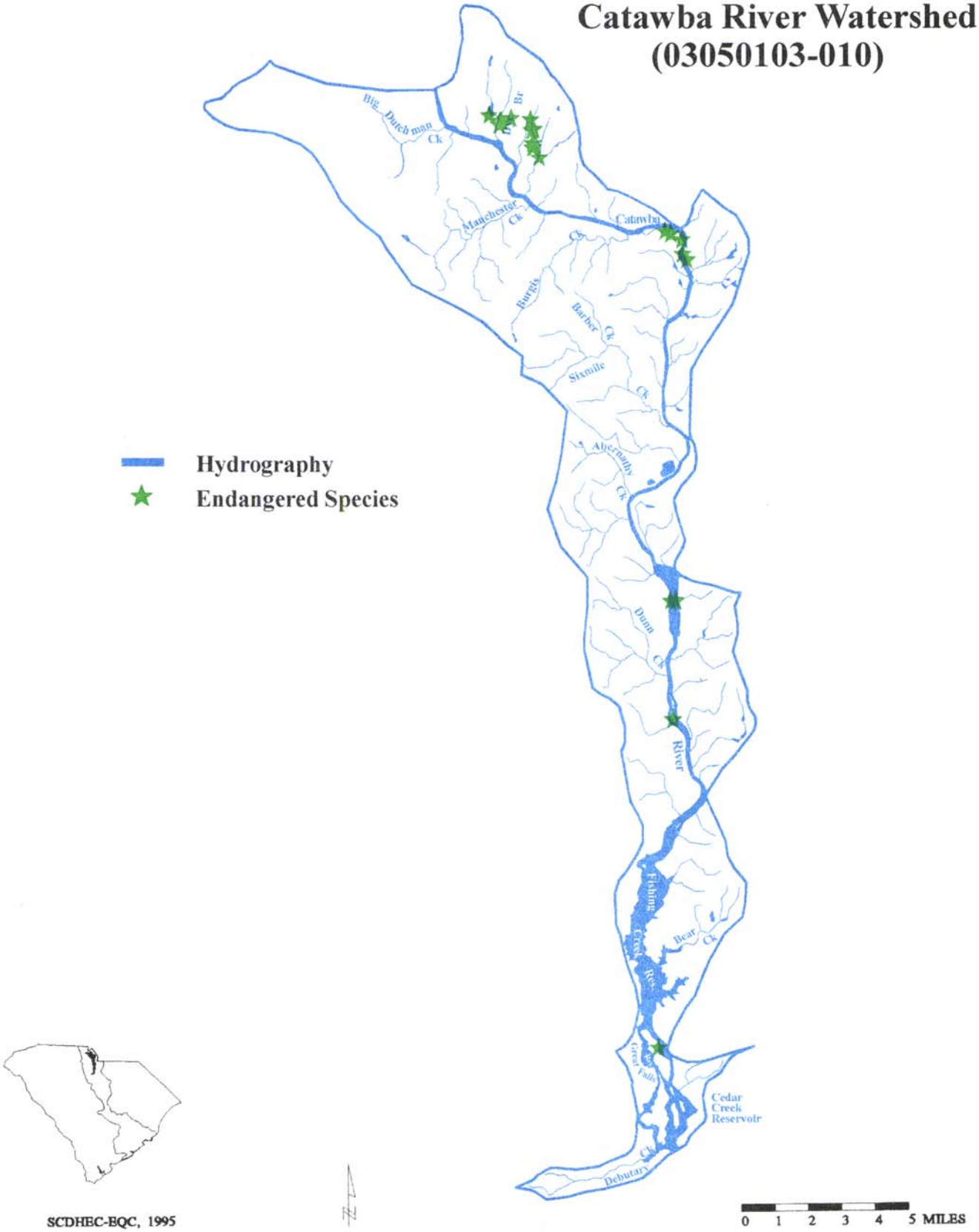
many development factors, the presence of Rock Hill and Fort Mill, and the presence of I-77 with five full interchanges in this watershed all point to extensive growth over the next few years.

Implementation Strategy

Aquatic life uses are impaired along the Catawba River due to low dissolved oxygen concentrations occurring below the Lake Wylie and Great Fall Reservoir Dams. The affects of the low DO condition will continue to be studied. Both aquatic life and recreational uses are impaired for a tributary to the Catawba River. Aquatic life is impaired by elevated copper and zinc concentrations from unknown sources. The Department's Watershed Implementation Staff will determine, if possible, the sources and recommend solutions to correct the problem. Recreational use is impaired by point source related fecal coliform bacteria. The permits for these dischargers are being revised and the bacterial condition is expected to improve with the new NPDES permits limits. Fishing Creek Reservoir has an increasing trend in pH and turbidity, and a declining trend in dissolved oxygen concentrations due to unknown sources. An evaluation of these situations is ongoing.

Natural Resources

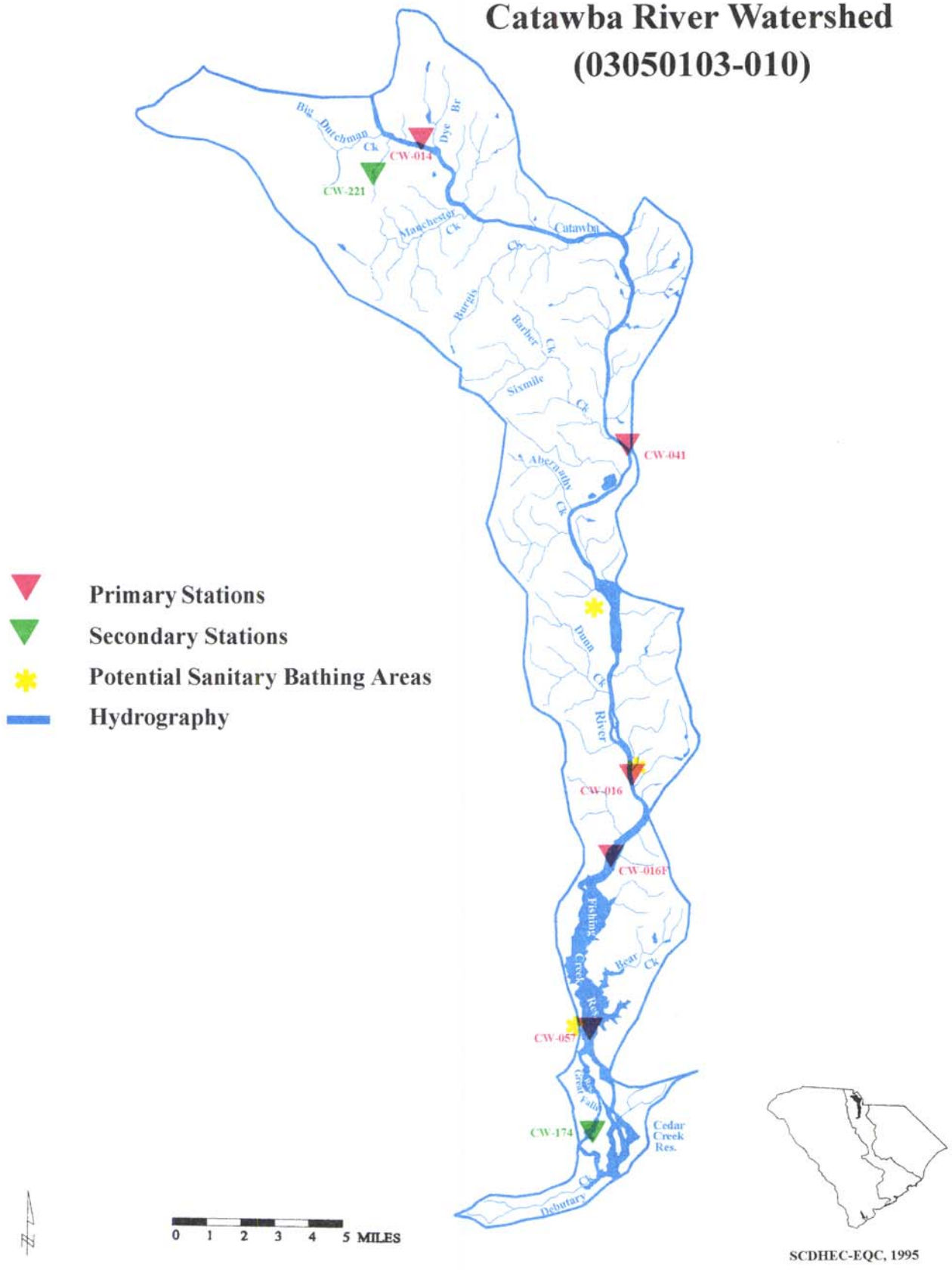
Catawba River Watershed (03050103-010)



SCDHEC-EQC, 1995

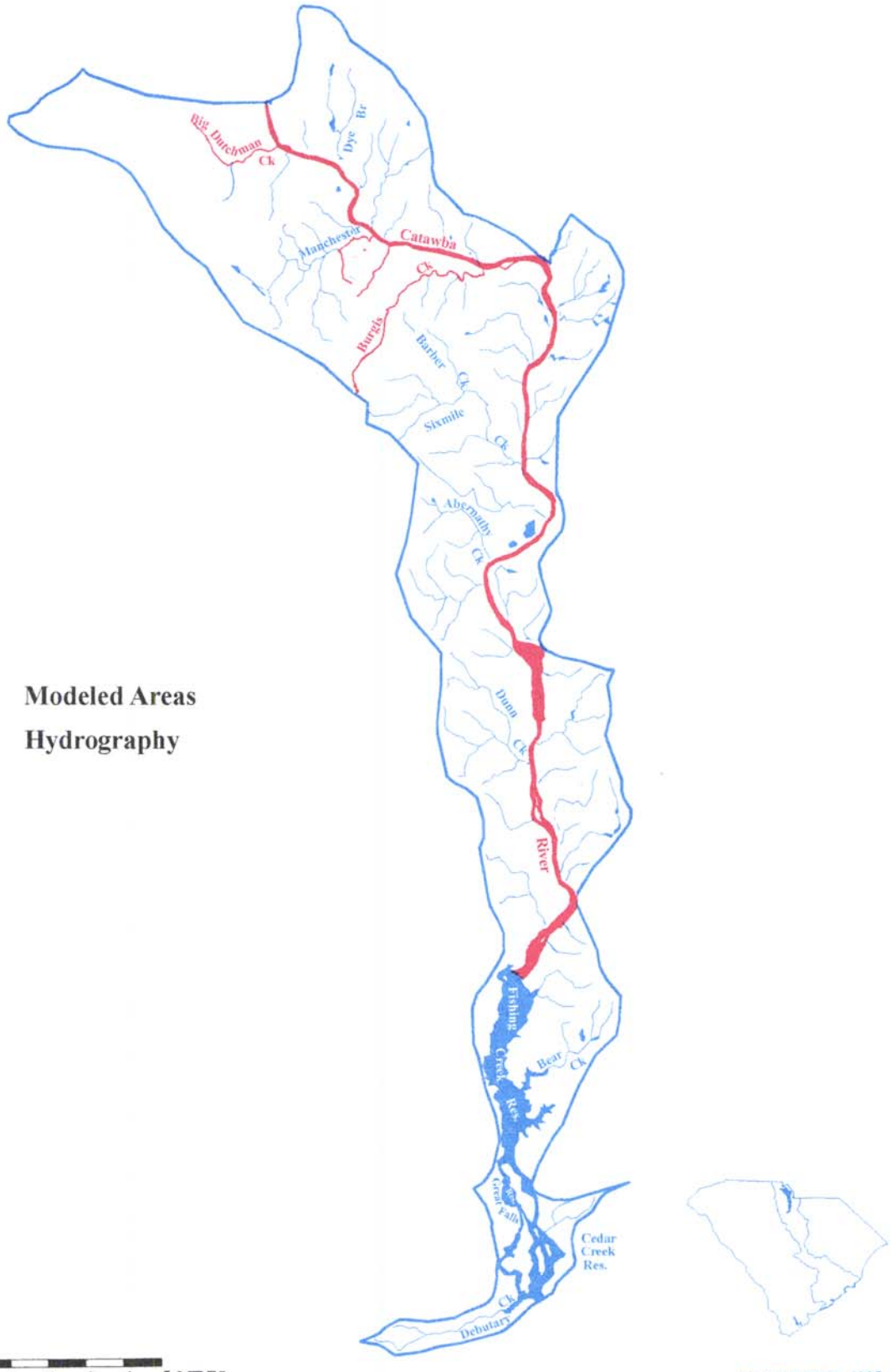
Water Quality Monitoring Stations

Catawba River Watershed (03050103-010)



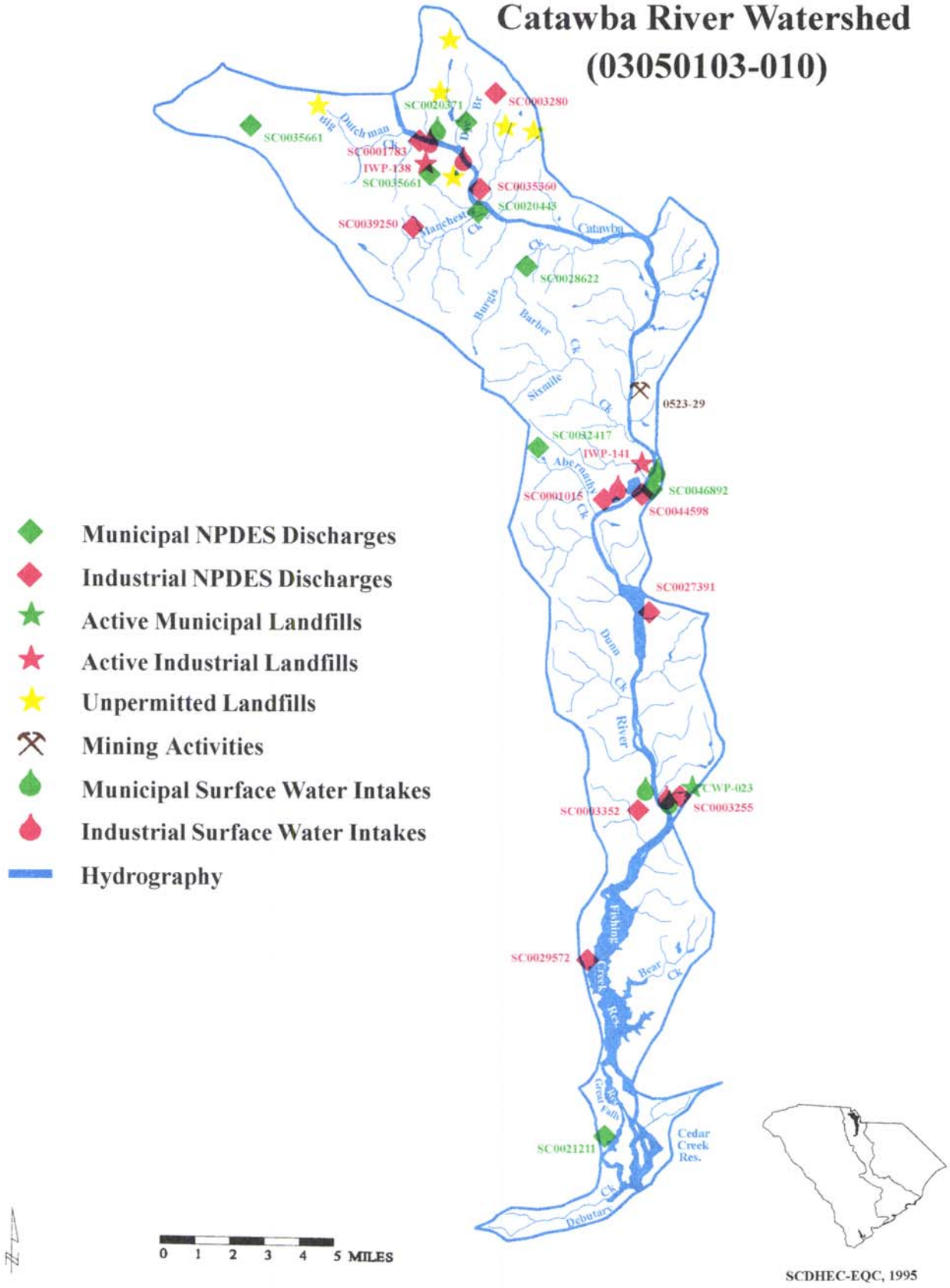
Streams Modeled for Wasteload Allocation

Catawba River Watershed (03050103-010)



Activities Potentially Affecting Water Quality

Catawba River Watershed (03050103-010)



SCDHEC-EQC, 1995

03050103-028

(Sugar Creek)

General Description

Watershed 03050103-028 is located in York and Lancaster Counties and consists primarily of ***Sugar Creek*** and its tributaries. The watershed occupies 30,316 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Mecklenburg-Iredell series. The erodibility of the soil (K) averages 0.27; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 5.12% urban land, 12.91% agricultural land, 6.33% scrub/shrub land, 1.09% barren land, 73.42% forested land, and 1.13% water.

Sugar Creek originates in North Carolina, near the City of Charlotte, and accepts drainage from Flint Hill Branch, Little Sugar Creek, and McAlpine Creek before reaching Steele Creek. Steele Creek also originates in North Carolina and accepts drainage from Blankmanship Branch and Jackson Branch before flowing through the Town of Fort Mill and into Sugar Creek. There are several lakes and ponds (Lake Patricia and Lake Haigler) near the Town of Fort Mill (12-25 acres) used for irrigation and recreation, and a total of 58.6 stream miles in this watershed, all classified FW.

Water Quality

Sugar Creek - There are four SCDHEC monitoring sites along Sugar Creek, which was Class B until April, 1992. Bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Recreational uses are not supported at any of these sites due to fecal coliform bacteria excursions under Class FW standards. Aquatic life uses are fully supported upstream of the confluence with Little Sugar Creek (in North Carolina). Between the confluence with Little Sugar Creek and McAlpine Creek, aquatic life uses are not supported based on macroinvertebrate community data.

Aquatic life uses may not be supported at station CW-013 due to very high concentrations of zinc measured in water in 1990, compounded by significantly increasing trends in pH and total nitrogen concentrations. However, a significantly increasing trend in dissolved oxygen, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. Aquatic life uses are fully supported immediately upstream of Sugar Creek's confluence with the Catawba River.

Special Study on Sugar Creek

A special water quality survey of Sugar Creek, located in York and Lancaster Counties, South Carolina, and Mecklenburg County, North Carolina, was conducted by the Department's Water Quality Monitoring Section during the summer of 1993 (SCDHEC 1994d). The main purpose of this study was to collect bacteriological data with strict adherence to the sampling frequency used as the

basis for the South Carolina State Standards, as well as to provide additional information to the North Carolina Department of Environmental Management for use in the development of their basin management plan for the area. Stations were selected to provide wide spatial coverage of the watershed. Fourteen stations were sampled five times between June 7, 1993 and July 6, 1993 for fecal coliform bacteria, dissolved oxygen, water temperature, and pH. During the intensive 30 day sampling period, all fourteen sites failed to meet South Carolina Class FW fecal coliform standards. Dissolved oxygen standards were contravened in more than 10% of the samples collected during the study at three sites, one on Steele Creek and two on McAlpine Creek. Because these sites were only sampled during summer months, the monitoring data is intentionally biased towards periods of lower dissolved oxygen concentrations. Total phosphorus concentrations in portions of Little Sugar Creek, McAlpine Creek and Sugar Creek were consistently elevated relative to statewide conditions in South Carolina.

Little Sugar Creek - Aquatic life uses are fully supported at this site (in North Carolina); however, recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

McAlpine Creek - There are two SCDHEC monitoring sites along McAlpine Creek, which was Class B until April, 1992. Bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Recreational uses are not supported at either site due to fecal coliform bacteria excursions under Class FW standards, compounded by significantly increasing trends in fecal coliform bacteria concentrations. Aquatic life uses are fully supported at the upstream site (in North Carolina), but may be threatened by a significantly increasing trend in total nitrogen concentration. A very high concentration of chromium was measured in the 1992 sediment sample. Aquatic life uses are not supported at the downstream site based on macroinvertebrate community data and dissolved oxygen excursions. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus suggest improving conditions.

Steele Creek - There are four SCDHEC monitoring sites along Steele Creek, which was Class B until April, 1992. Bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Recreational uses are not supported at any site due to fecal coliform bacteria excursions under Class FW standards. Aquatic life uses are only partially supported at the furthest upstream site (CW-009) due to dissolved oxygen excursions. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions. Aquatic life uses are fully supported further downstream at CW-203, and also at CW-681, which was based on macroinvertebrate community data. Aquatic life uses are also fully supported at the furthest downstream site, and significantly decreasing trends in five-day

biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. A significantly increasing trend in pH was also noted.

Activities Potentially Affecting Water Quality

Point Source Contributions

Sugar Creek, Steele Creek, and McAlpine Creek are included on the §303(d) high priority list of waters targeted for TMDL development. Sugar Creek is listed due to fecal coliform concerns, and Steele Creek and McAlpine Creek are listed due to dissolved oxygen and fecal coliform concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
SUGAR CREEK YORK COUNTY/NEW HERITAGE CAROLINA, INC. PIPE #: 001 FLOW: 1.0 WQL FOR BOD_5, NH3-N, TRC, DO	SC0022705 MAJOR MUNICIPAL WATER QUALITY
SUGAR CREEK NEW HERITAGE CAROLINA, INC. PIPE #: 001 FLOW: 2.0 PROPOSED; WQL FOR NH3-N, TRC, DO	SC0022705 MAJOR MUNICIPAL WATER QUALITY
SUGAR CREEK FOXWOOD SD/BLUE RIBBON UTIL. PIPE #: 001 FLOW: 0.12	SC0027146 MINOR COMMUNITY EFFLUENT
SUGAR CREEK PLEASANT VALLEY SD PIPE #: 001 FLOW: 0.046 WQL FOR BOD_5, NH3-N, TRC, DO; UNCONSTRUCTED	SC0042897 MINOR COMMUNITY WATER QUALITY
SUGAR CREEK TRIB P. KAUFFMAN INC. PIPE #: 001 FLOW: 0.01 WQL FOR BOD_5, NH3-N, TRC, DO	SC0022799 MINOR INDUSTRIAL WATER QUALITY
SUGAR CREEK TRIB INDIANLAND SCHOOL PIPE #: 001 FLOW: 0.03 WQL FOR BOD_5, NH3-N, TRC, DO	SC0035033 MINOR COMMUNITY WATER QUALITY
SUGAR CREEK TRIB FAITH TEMPLE BINGO PIPE #: 001 FLOW: 0.006 WQL FOR NH3-N, TRC, DO	SC0038563 MINOR COMMUNITY WATER QUALITY
SUGAR CREEK TRIB MCCLANCY SEASONING CO. PIPE #: 001 FLOW: .0015 WQL FOR TRC; UNCONSTRUCTED	SC0046787 MINOR INDUSTRIAL WATER QUALITY

FLINT HILL BRANCH TWIN LAKES MOBILE EST PIPE #: 001 FLOW: 0.0625 WQL FOR BOD_5, NH3-N, TRC, DO	SC0031208 MINOR COMMUNITY WATER QUALITY
MCALPINE CREEK LAMPLIGHTER VILLAGE SD/CWS PIPE #: 001 FLOW: 0.63 WQL FOR BOD_5, NH3-N, TRC, DO	SC0030112 MINOR COMMUNITY WATER QUALITY
STEELE CREEK PINELAKES CAMPGROUND PIPE #: 001 FLOW: 0.038 WQL FOR NH3-N, TRC	SC0024759 MINOR COMMUNITY WATER QUALITY
STEELE CREEK SC HWY DEPT/WELCOME STA PIPE #: 001 FLOW: 0.03 WQL FOR NH3-N, TRC, DO	SC0026301 MINOR COMMUNITY WATER QUALITY
STEELE CREEK PINECREST MHP PIPE #: 001 FLOW: 0.012	SC0031151 MINOR COMMUNITY EFFLUENT
STEELE CREEK YORK COUNTY PIPE #: 001 FLOW: 0.40 WQL FOR BOD_5, NH3-N, TRC, DO	SC0040011 MINOR COMMUNITY WATER QUALITY
JACKSON BRANCH KIMBRELLS TRAILER PRK PIPE #: 001 FLOW: 0.018 WQL FOR BOD_5, NH3-N, TRC, DO	SC0022985 MINOR COMMUNITY WATER QUALITY
JACKSON BRANCH MACO COMMERCIAL PRK PIPE #: 001 FLOW: 0.01 WQL FOR BOD_5, NH3-N, TRC, DO	SC0041483 MINOR COMMUNITY WATER QUALITY
JACKSON BRANCH TEGA CAY VILLAGE/CAROWOOD SD PIPE #: 001 FLOW: 0.025 WQL FOR BOD_5, NH3-N, TRC, DO	SC0042510 MINOR COMMUNITY WATER QUALITY
JACKSON BRANCH TRIB CAROWOOD SD/YORK UTIL. PIPE #: 001 FLOW: 0.02 WQL FOR NH3-N, TRC, DO	SC0038113 MINOR COMMUNITY WATER QUALITY
LAND APPLICATION SYSTEM FACILITY NAME	***ND# TYPE***
SPRAYFIELD LAZY DAZE CAMPGROUND	ND0067105 MINOR COMMUNITY

Nonpoint Source Contributions

Steele Creek is included on the §319 list of as waters impacted by agricultural activities. Water samples collected by the Department from the upstream site indicate elevated fecal coliform and nutrient levels on numerous occasions, and scattered elevated turbidity levels and excursions of dissolved oxygen and BOD_5. Water samples from the downstream site also indicate elevated fecal coliform levels on numerous occasions, together with scattered elevated turbidity levels. Steele Creek and McAlpine Creek are also included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants.

Landfill Activities

There are three construction landfills (two active, one closed) and five unpermitted landfills (one active, four closed) in this watershed.

Growth Potential

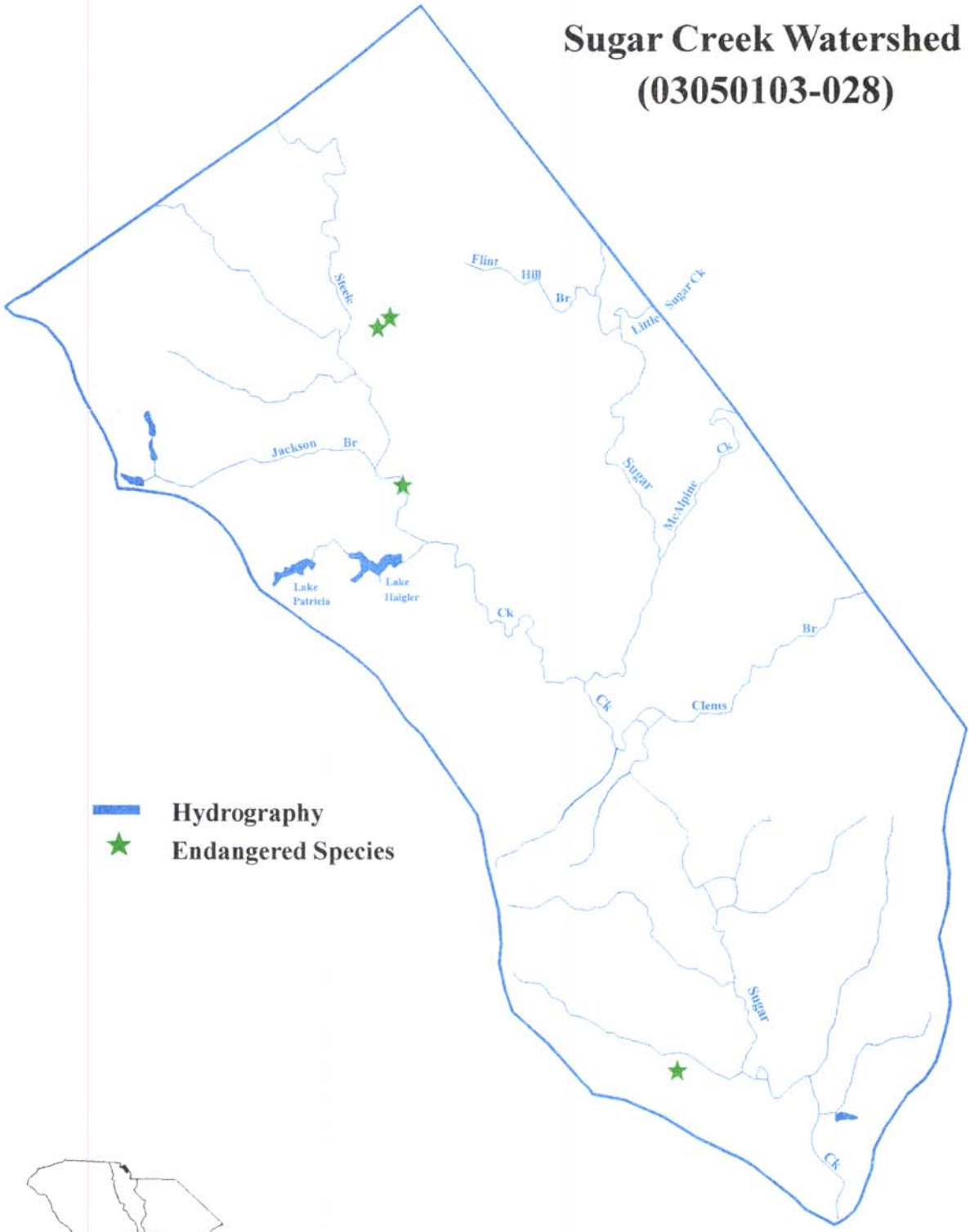
This watershed contains a portion of the Town of Fort Mill and rapidly growing residential areas near I-77 in the Fort Mill Township. Major development factors include the Paramount Carowinds amusement park and surrounding industrial park area, the Heritage retreat, and the Charlotte Knights baseball stadium. Water service is present in all sections of the watershed, except for some area east of Fort Mill. Sewer service is present in Fort Mill and surrounding areas. A proposed Steele Creek sewer line would eliminate small treatment plants and open the area for denser development. The City of Charlotte has proposed to substantially increase the discharge flow for its facilities. The presence of the expanding Charlotte urban area just across the State line and the easy access via I-77 result in a strong growth trend, which should continue into the near future. Transportation factors which will have an impact on the area include the proposed widening of I-77, a proposed Fort Mill bypass for S.C. Highway 160, and a connector being constructed between the Heritage retreat and Mecklenburg County, N.C.

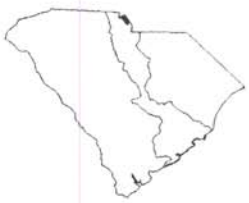
Implementation Strategy

Sugar and McAlpine Creeks both have aquatic life and recreational uses impaired by North Carolina point and nonpoint sources. Little Sugar Creek has impaired recreational uses by the same sources. Aquatic life impairments include impacted macroinvertebrate communities and elevated metal concentrations, and recreation is impaired by elevated fecal coliform bacteria concentrations. The City of Charlotte in North Carolina is currently upgrading its water treatment plant to improve treatment under low flow conditions, and is expyected to improve these conditions. Steele Creek has impaired aquatic life and recreational uses for low dissolved oxygen and elevated fecal coliform concentrations from point and nonpoint sources. The permits for the point source dischargers are being revised and the bacterial condition is expected to improve with the new NPDES permit limits. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments along Steele Creek and recommend solutions to correct the problem.

Natural Resources

Sugar Creek Watershed (03050103-028)



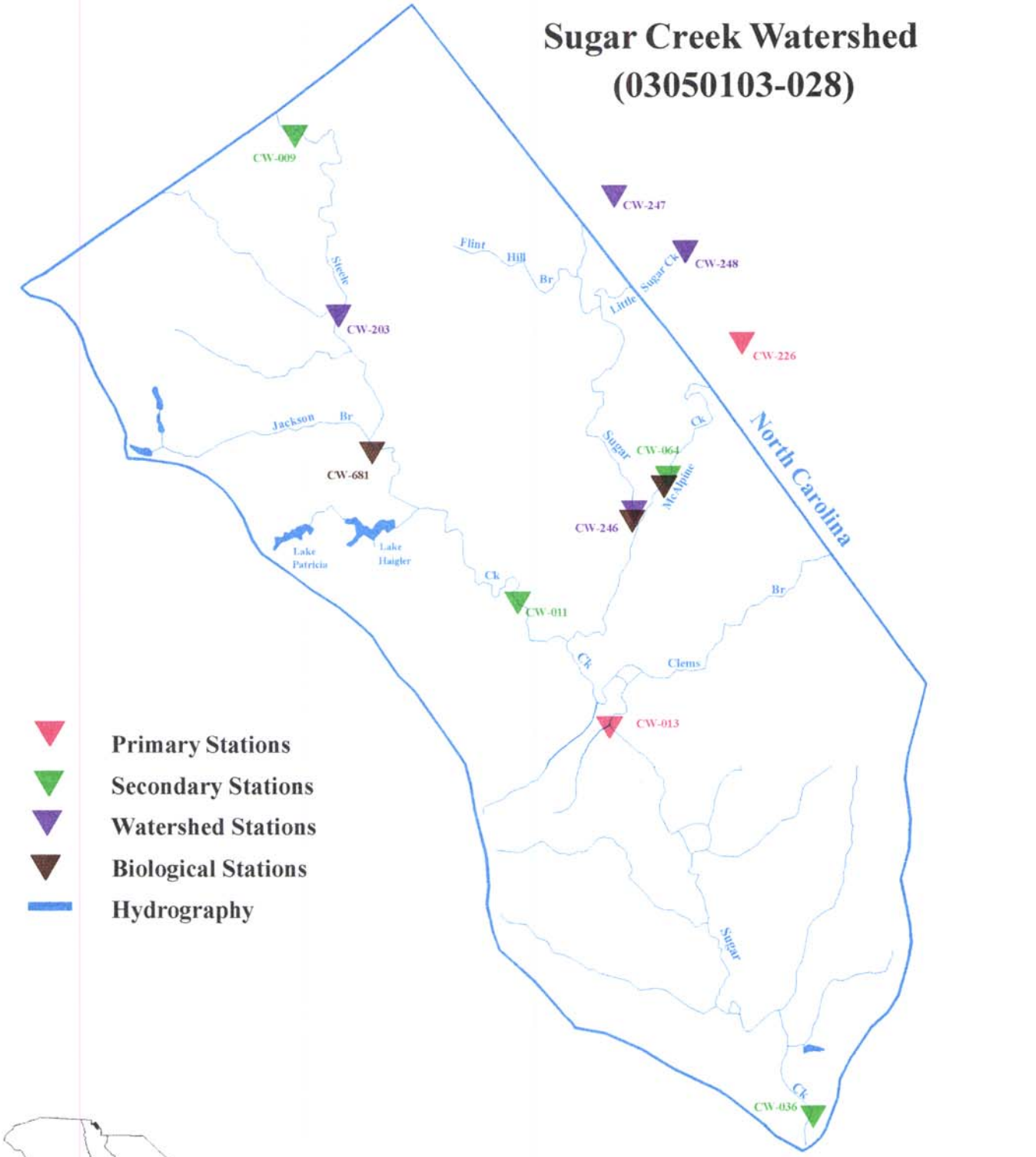


SCDHEC-BQC, 1995

0 1 2 3 4 5 MILES

Water Quality Monitoring Stations

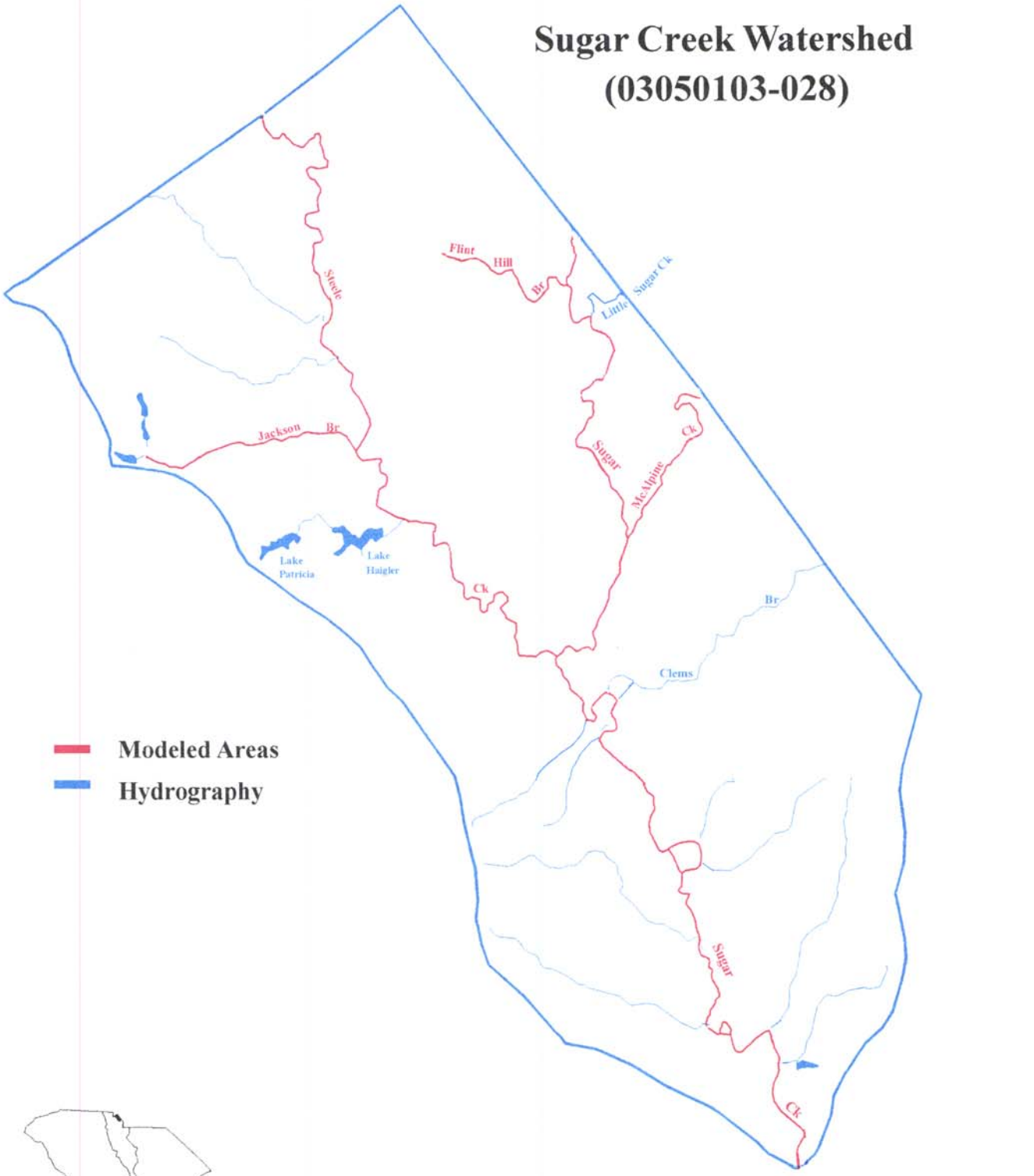
Sugar Creek Watershed (03050103-028)



SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

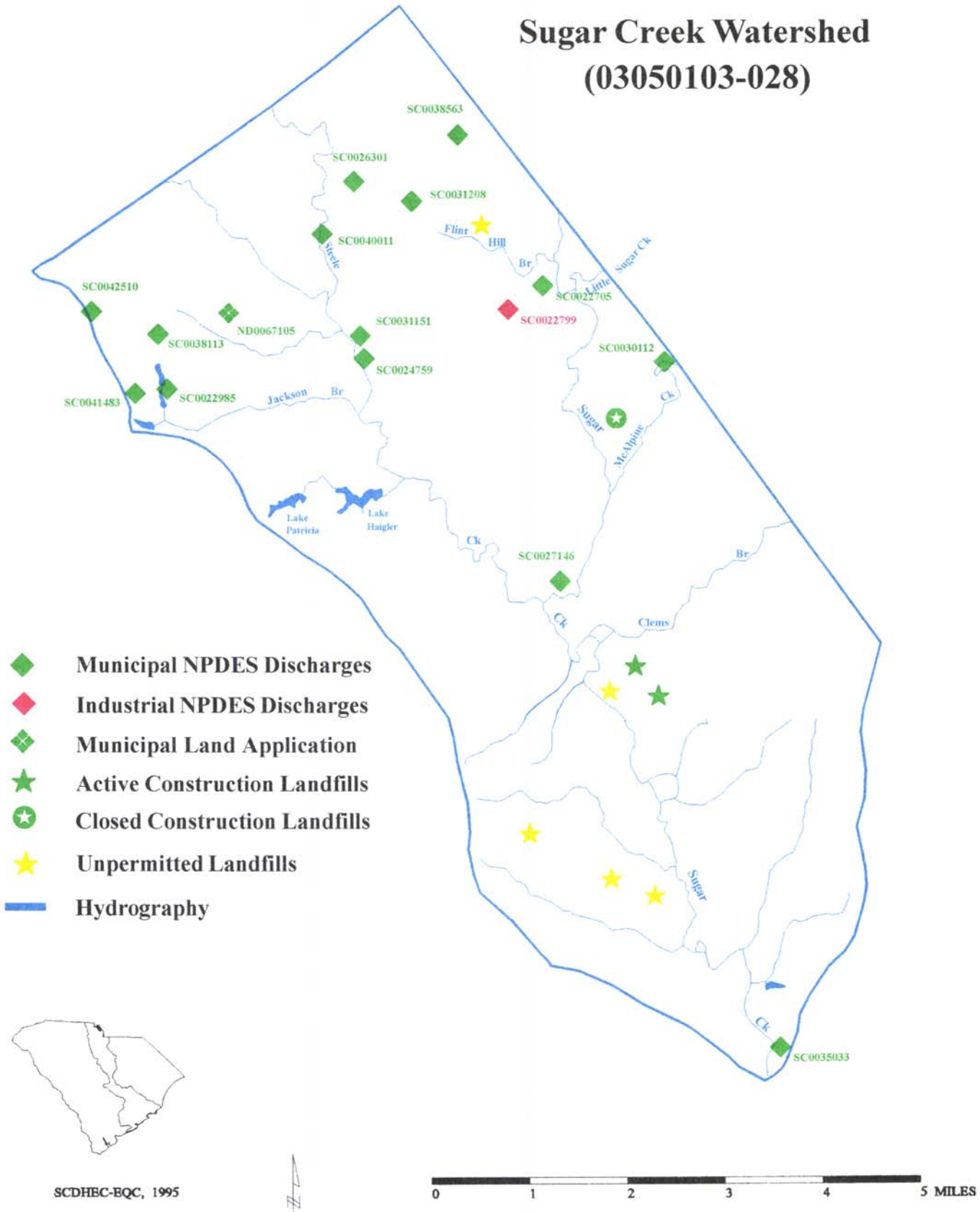
Sugar Creek Watershed (03050103-028)



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Sugar Creek Watershed (03050103-028)



03050103-038

(Twelvemile Creek)

General Description

Watershed 03050103-038 is located in Lancaster County and consists primarily of ***Twelvemile Creek*** and its tributaries. The watershed occupies 28,065 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Appling-Vance-Cecil-Enon series. The erodibility of the soil (K) averages 0.32; the slope of the terrain averages 7%, with a range of 2-15%. Land use/land cover in the watershed includes: 0.19% urban land, 21.51% agricultural land, 4.03% scrub/shrub land, 0.42% barren land, 72.94% forested land, and 0.91% water.

The Twelvemile Creek watershed originates in North Carolina and drains into the Catawba River. Cow Branch and Tarkill Branch (Long Branch) flow into Sixmile Creek, which drains into Twelvemile Creek. Twelvemile Creek also accepts drainage from Rone Branch, Millstone Branch, and Todd Branch before entering the Catawba River. Waxhaw Creek accepts drainage from Causar Creek (Andrew Jackson State Park Lake) and Mill Branch (Foster Branch) flows into the Catawba River downstream of Twelvemile Creek. There are a total of 91.0 stream miles and several small lakes and ponds in this watershed (12-18 acres), all classified FW.

Water Quality

Twelvemile Creek - Aquatic life uses are fully supported for this stream, which was Class B until April, 1992. A significantly declining trend in five-day biochemical oxygen demand suggests improving conditions. A significantly increasing trend in pH was also noted. Recreational uses are not supported at this station due to fecal coliform bacteria excursions under Class FW standards, which is compounded by a significantly increasing trend in fecal coliform bacteria concentrations.

Sixmile Creek - Aquatic life uses are fully supported for this stream, which was Class B until April, 1992, but may be threatened by a statistically significant decreasing trend in pH and significantly increasing trends in total phosphorus and total nitrogen concentrations. Also, a high concentration of zinc was measured in water in 1989. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Waxhaw Creek - Aquatic life uses are fully supported for this stream, which was Class B until April, 1992, but recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
CAUSAR BRANCH	SC0041807
HEALTH SOUTH/CENTRAL CAROLINAS	MINOR COMMUNITY
PIPE #: 001 FLOW: 0.008	WATER QUALITY
WQL FOR BOD_5, NH3-N, TRC, DO	

LAND APPLICATION SYSTEM	*ND#*
FACILITY NAME	*TYPE*
PERCOLATION	ND0067989
JINGLE-JUNGLE, INC.	MINOR COMMUNITY

Nonpoint Source Contributions

Twelvemile Creek is included on the §319 list as waters impacted by agricultural activities. Water samples collected by the Department indicate elevated fecal coliform levels on numerous occasions.

Landfill Activities

There is one active construction landfill is this watershed.

Mining Activities

MINING COMPANY	*PERMIT #*
MINE NAME	*MINERAL*
ASHE DIV., BORAL BRICKS,INC.	0002-29
HOWEY PIT	SERICITE
ASHE DIV., BORAL BRICKS,INC.	0003-29
MILLER PIT	SHALE
ASHE DIV., BORAL BRICKS,INC.	0004-29
ROBERT YODER PIT	SERICITE
ASHE DIV., BORAL BRICKS,INC.	0778-29
FAILE MINE	CLAY
PRESSLEY MINING COMPANY	0808-29
PRESSLEY MINE	CLAY

Growth Potential

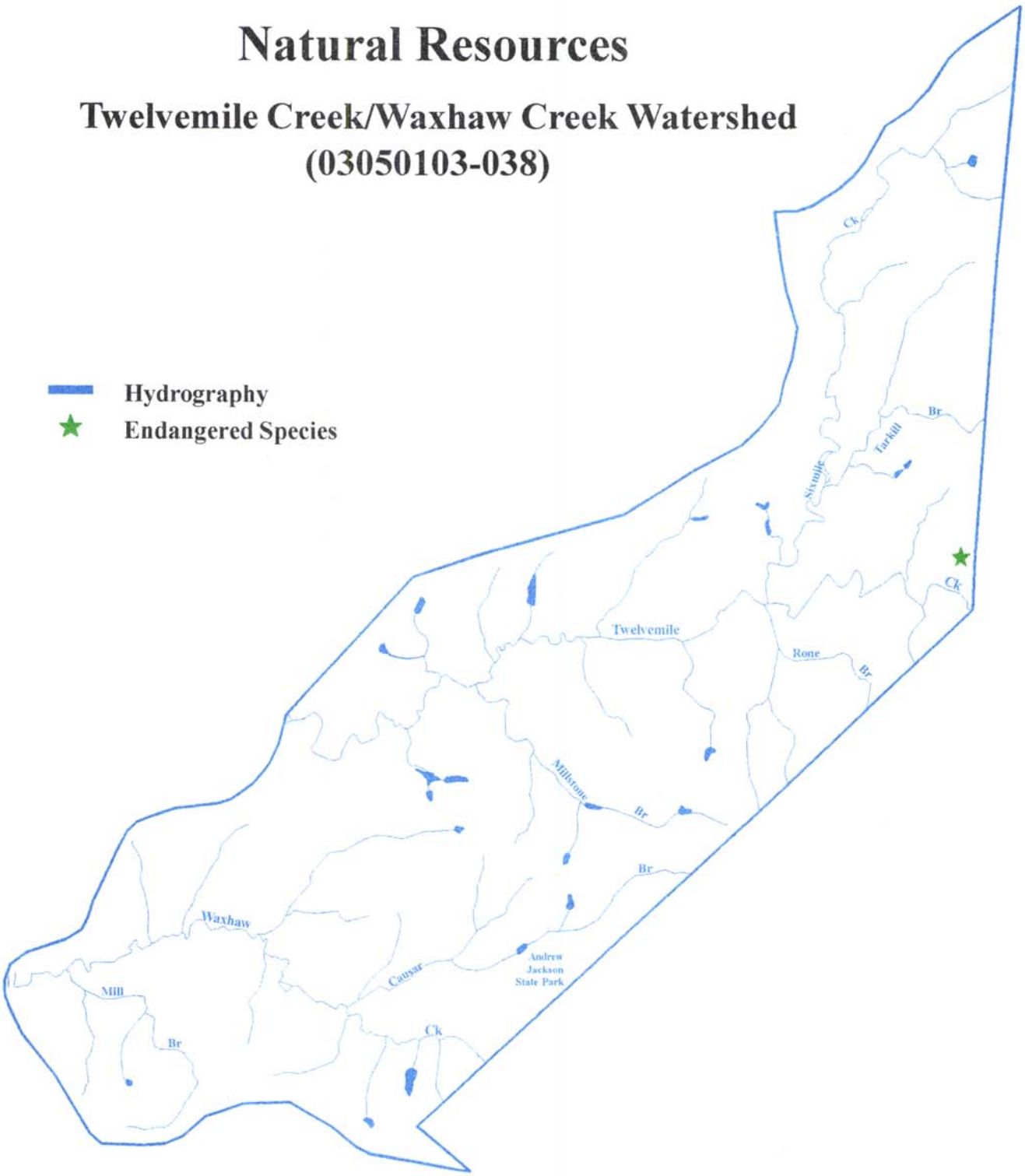
This area is adjacent to rapidly growing sections of the Charlotte urban area and has good access via the four-lane U.S. 521. Although the entire watershed is served by public water, there is currently no sewer service available. The lack of sewer service will retard dense development in this area, but scattered residential development will likely continue. An extension of Dave Lyle Boulevard from Rock Hill has been proposed, which would cross the Catawba River and pass through this watershed. An additional potential for growth is the proposed regional sewer plant, which could be located on the Catawba River south of S.C. 5. If built, this plant could provide sewer service to the area.

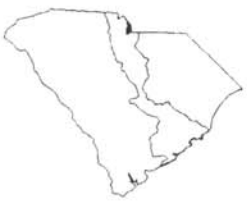
Implementation Strategy

Recreational uses on Twelvemile Creek, Sixmile Creek, and Waxhaw Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

Natural Resources

Twelvemile Creek/Waxhaw Creek Watershed (03050103-038)

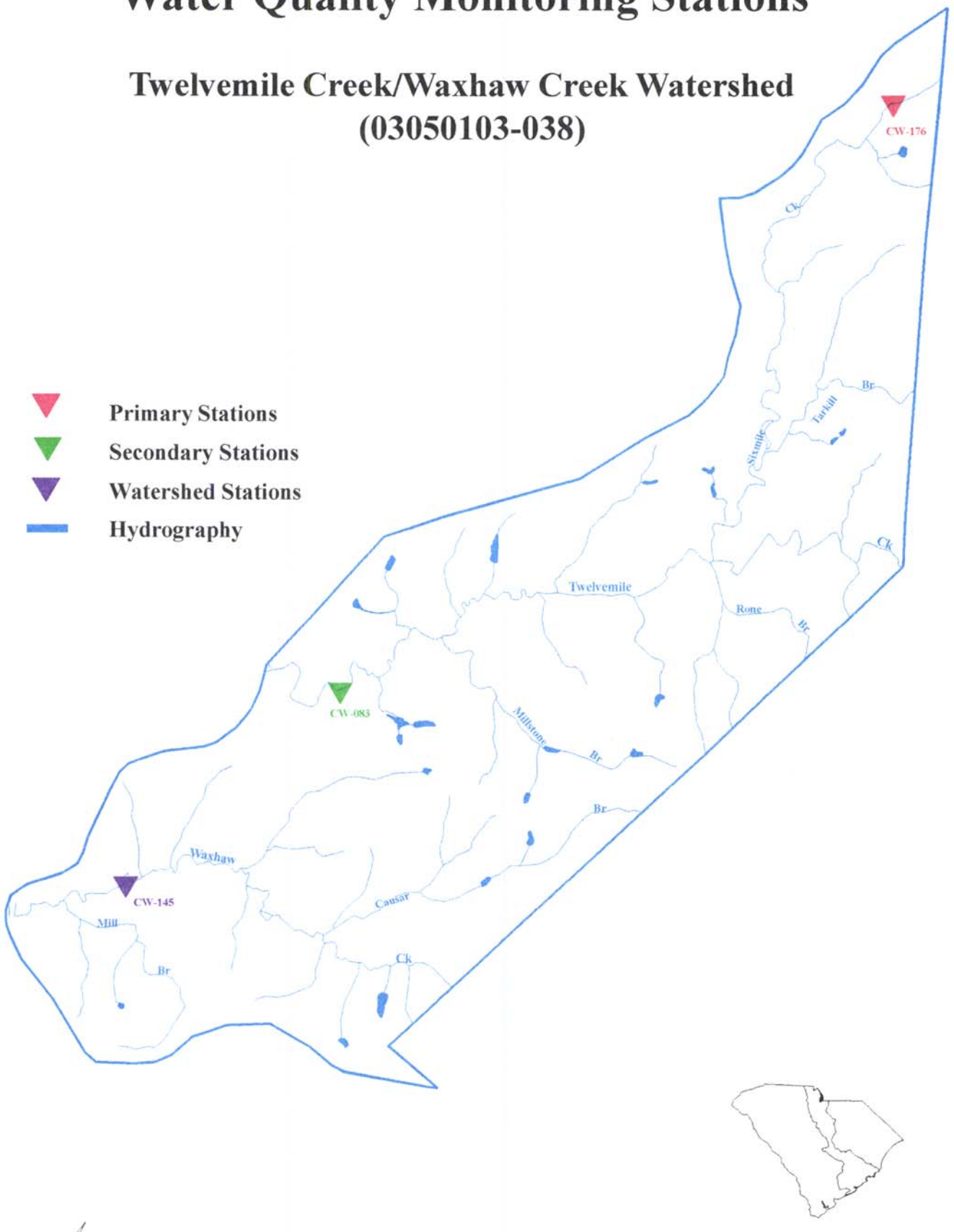




SCDHEC-EQC, 1995

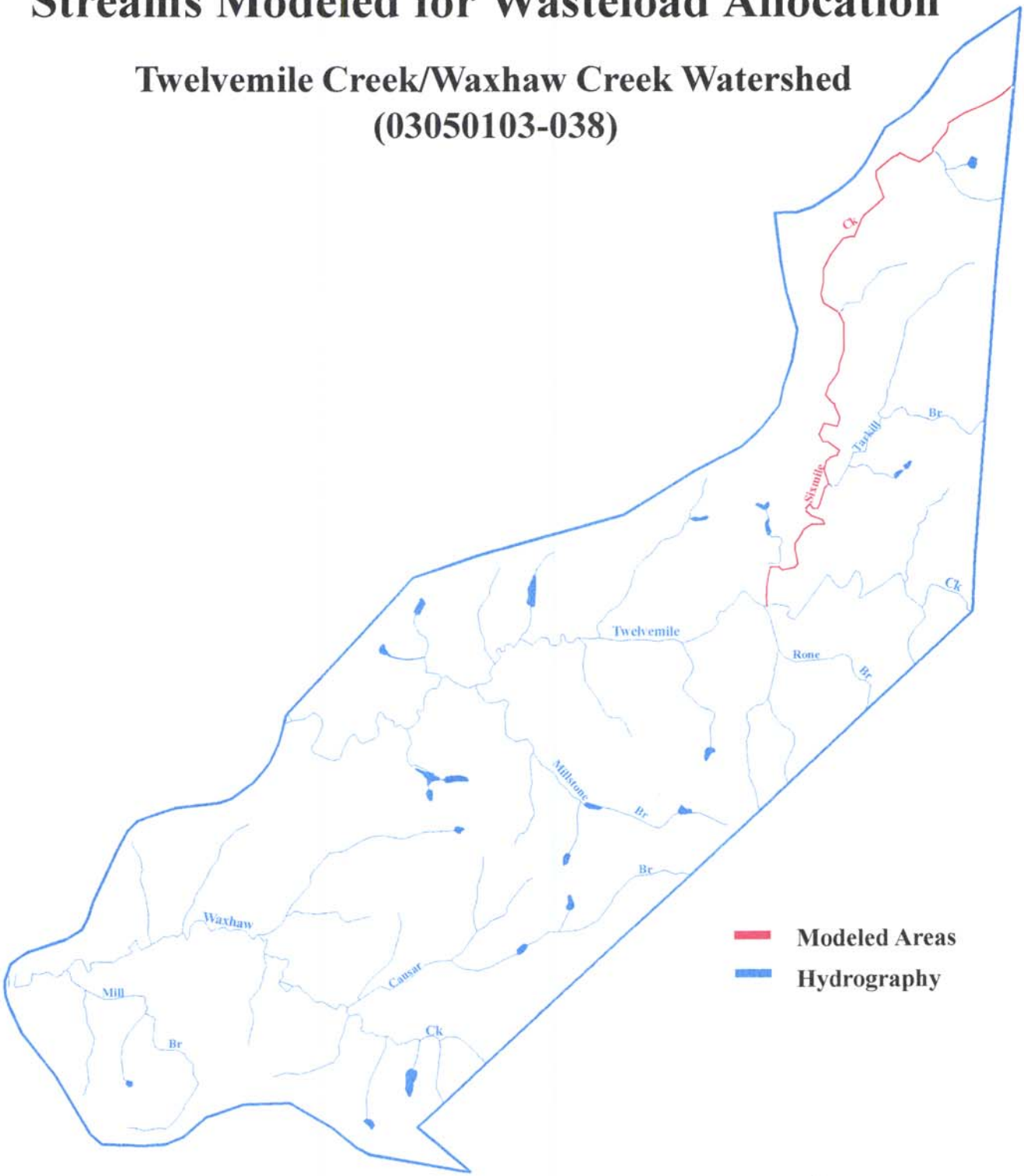
Water Quality Monitoring Stations

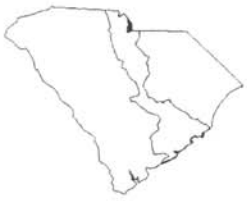
Twelvemile Creek/Waxhaw Creek Watershed (03050103-038)



Streams Modeled for Wasteload Allocation

Twelvemile Creek/Waxhaw Creek Watershed (03050103-038)



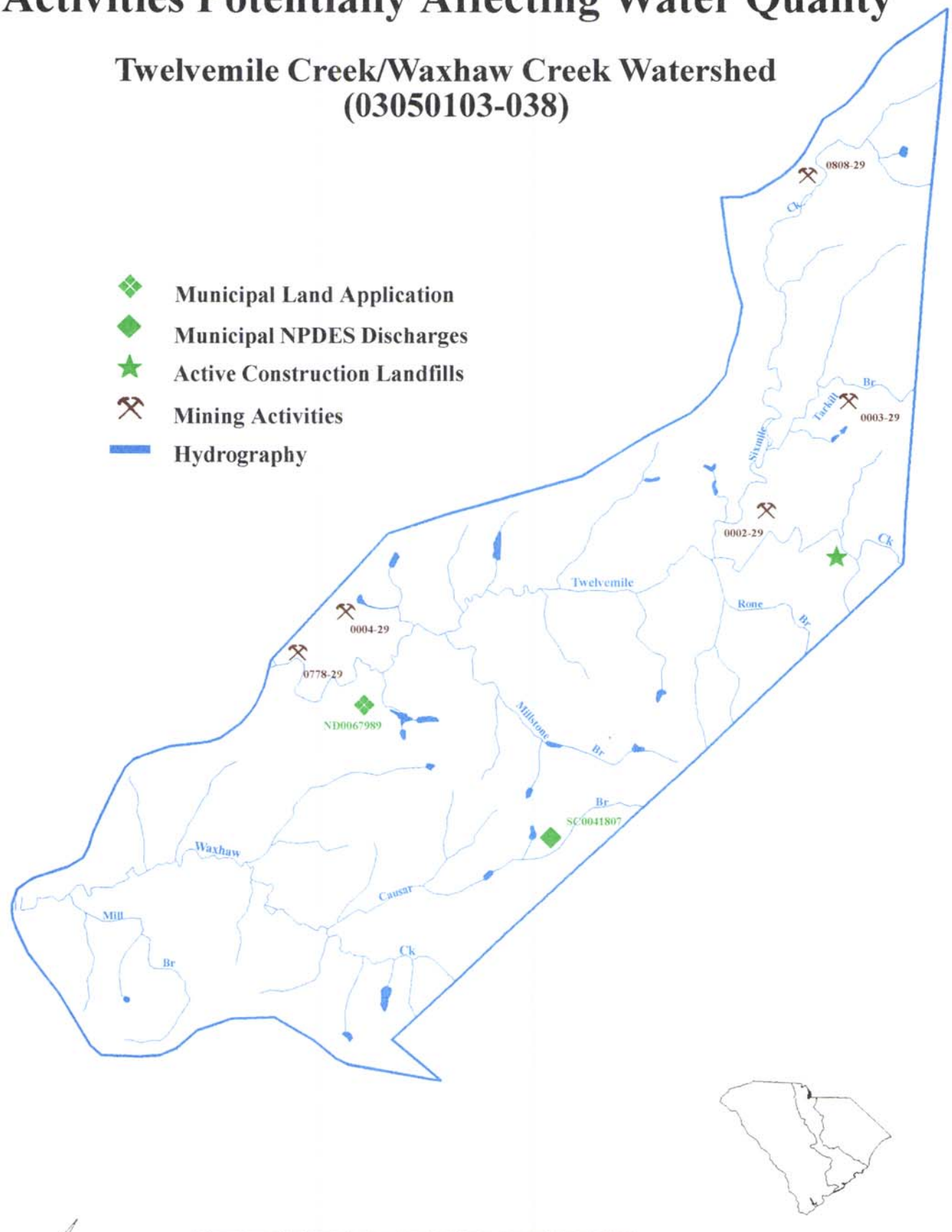


0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Twelvemile Creek/Waxhaw Creek Watershed (03050103-038)



SCDHEC-EQC, 1995

03050103-042

(Cane Creek)

General Description

Watershed 03050103-042 is located in Lancaster County and consists primarily of ***Cane Creek*** and its tributaries. The watershed occupies 129,183 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Helena-Herdon-Georgeville-Appling series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 12%, with a range of 2-45%. Land use/land cover in the watershed includes: 6.52% urban land, 15.12% agricultural land, 4.38% scrub/shrub land, 0.44 barren land, 71.24% forested land, 0.62% forested wetland, and 1.69% water.

Cane Creek originates in North Carolina and accepts drainage from Simpson Branch, Unity Branch, Flag Pond Branch, McAteer Branch, Sandy Branch, Cedar Pines Lake, and Camp Creek (North Prong, South Prong). Further downstream, the Bear Creek drainage enters Cane Creek. Bear Creek accepts drainage from Caney Branch and Dry Branch before flowing through the Lancaster Reservoir. Lancaster Reservoir (75 acres) is used for municipal and recreational purposes for the Town of Lancaster. Turkey Quarter Creek (Little Turkey Creek) flows into Bear Creek at the reservoir, and further downstream Gills Creek (Hannahs Creek) enters near the Town of Lancaster. Rum Creek drains into Cane Creek near the Town of Fort Lawn. There are numerous small lakes and ponds (15-35 acres) for flood control purposes and a total of 264.2 stream miles in this watershed, all classified FW.

Water Quality

Cane Creek - There are three SCDHEC monitoring sites along Cane Creek, which was Class B until April, 1992. Aquatic life uses are only partially supported at the upstream site due to dissolved oxygen excursions. However, since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. In addition, a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. Recreational uses are not supported at the upstream site due to fecal coliform bacteria excursions under Class FW standards.

Aquatic life uses are fully supported at the midstream site based on macroinvertebrate community data. At the downstream site, aquatic life uses are not supported due to dissolved oxygen excursions. This is also a secondary monitoring station, and sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions under Class FW standards.

Bear Creek - There are two SCDHEC monitoring sites along Bear Creek, which was Class B until April, 1992. Recreational uses are not supported at either site due to fecal coliform bacteria

excursions under Class FW standards. Aquatic life uses are only partially supported at the upstream site due to dissolved oxygen excursions. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Aquatic life uses are fully supported at the downstream site. A significantly increasing trend in dissolved oxygen, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions.

Gills Creek - This creek was Class B until April, 1992. Aquatic life uses are fully supported. A significantly increasing trend in dissolved oxygen, and a significantly decreasing trend in five-day biochemical oxygen demand suggest improving conditions. A significantly increasing trend in pH was also noted. Recreational uses are not supported at this station due to fecal coliform bacteria excursions under Class FW standards.

Rum Creek - Aquatic life uses are not supported due to dissolved oxygen excursions, compounded by a high concentration of chromium measured in water in 1993. This creek was Class B until April, 1992. Recreational uses are not supported at this station due to fecal coliform bacteria excursions under Class FW standards.

Activities Potentially Affecting Water Quality

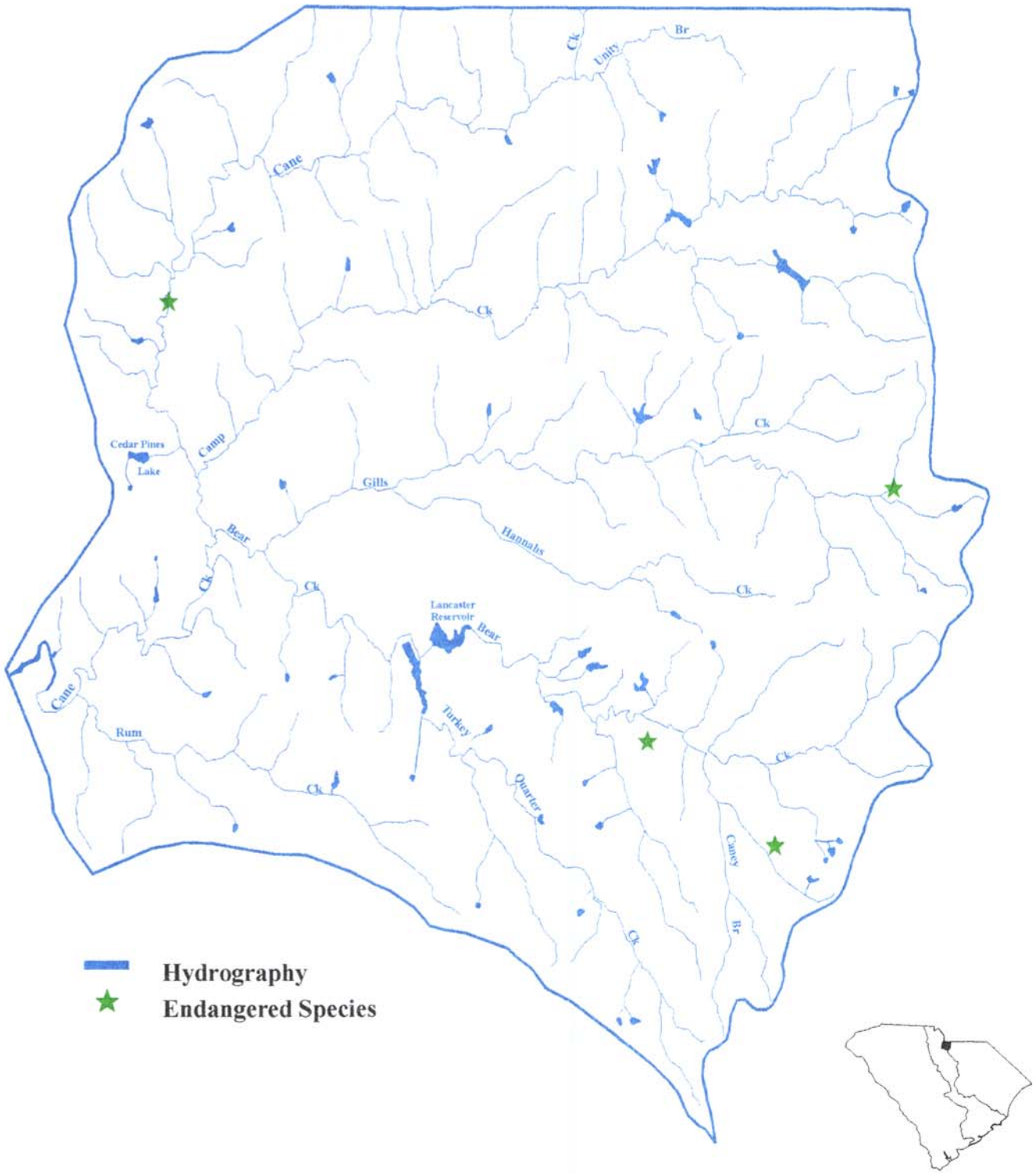
Point Source Contributions

Gills Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform concerns. Bear Creek and Rum Creek are also included on the §303(d) low priority list for dissolved oxygen and fecal coliform concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
CANE CREEK SPRINGS IND./LANCASTER PIPE #: 001 FLOW: 0.01 AIRWASH WATER	SC0003263 MINOR INDUSTRIAL EFFLUENT
CANE CREEK CITY OF LANCASTER/MAIN PLANT PIPE #: 001 FLOW: 3.0 WQL FOR BOD_5, NH3-N, TRC, DO TO BE ELIMINATED TO CATAWBA RIVER	SC0022080 MAJOR MUNICIPAL WATER QUALITY
CANE CREEK MCATEER TRAILER PARK PIPE #: 001 FLOW: .00565 WQL FOR NH3-N, TRC, DO	SC0027383 MINOR COMMUNITY WATER QUALITY

Natural Resources

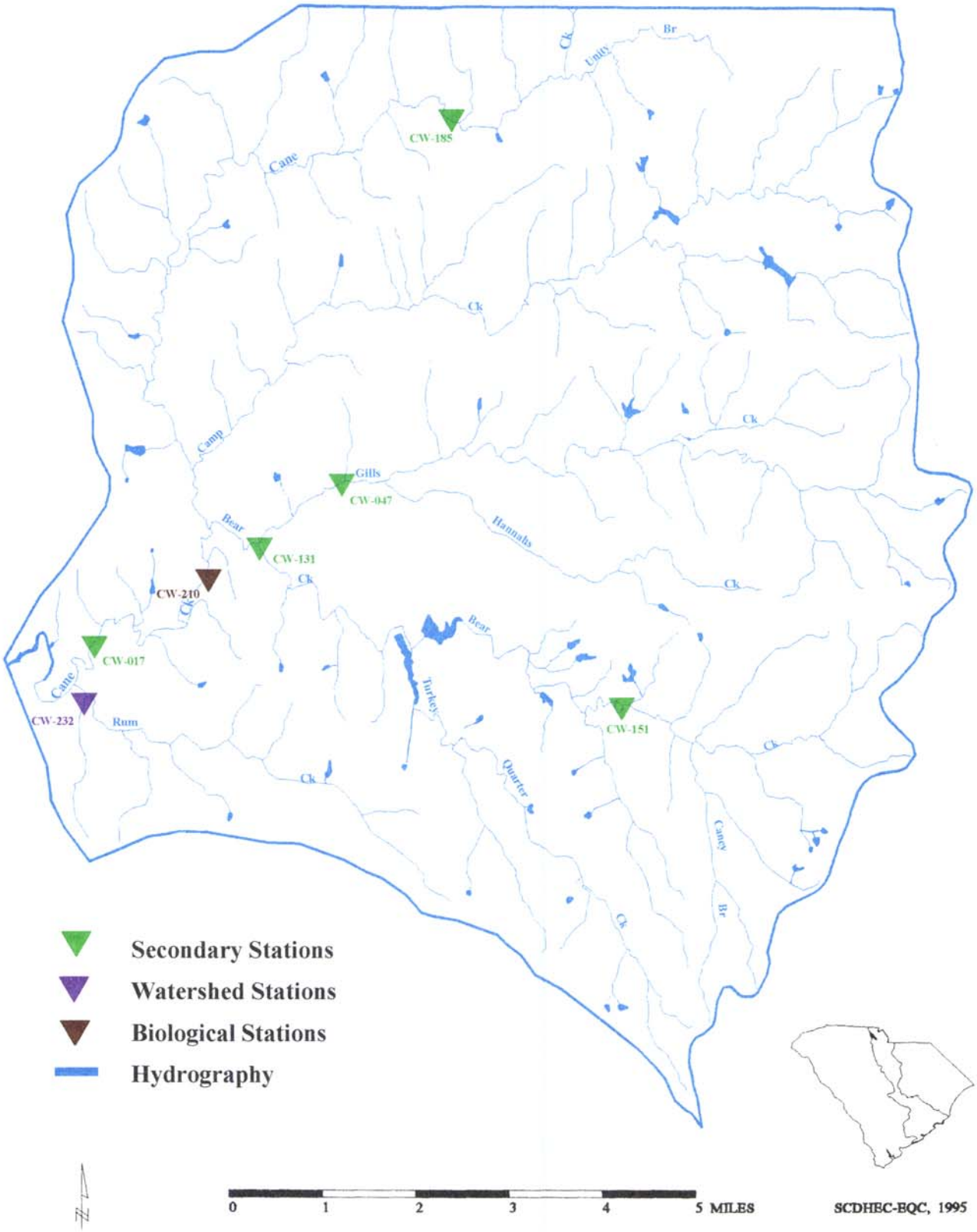
Cane Creek Watershed
(03050103-042)



SCDHEC-EQC, 1995

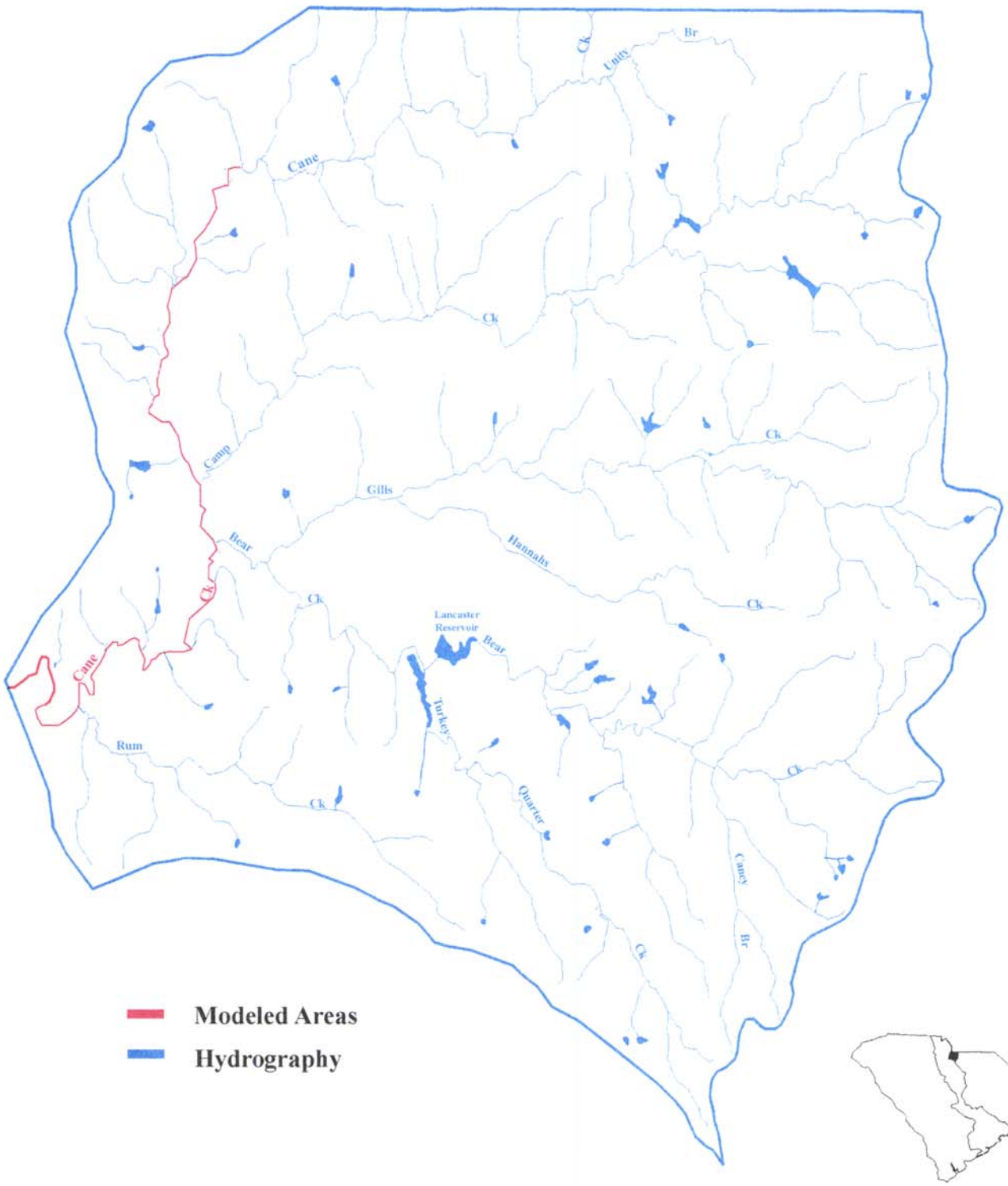
Water Quality Monitoring Stations

Cane Creek Watershed
(03050103-042)



Streams Modeled for Wasteload Allocation

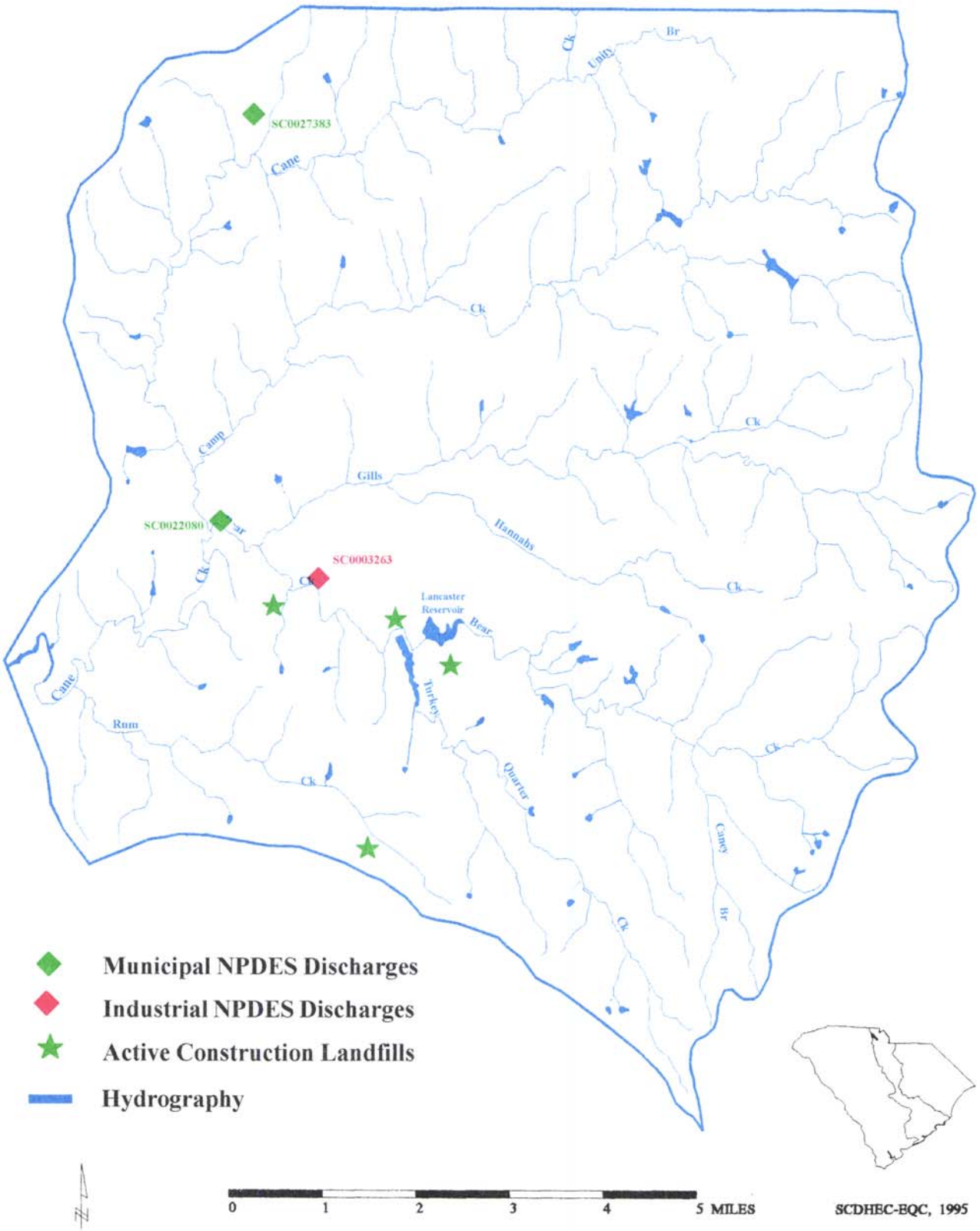
Cane Creek Watershed
(03050103-042)



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Cane Creek Watershed
(03050103-042)



Nonpoint Source Contributions

Cane Creek, Bear Creek, and Gills Creek are included on the §319 list as waters impacted by nonpoint sources. Cane Creek is impacted by agricultural activities, and water samples collected by the Department indicate elevated fecal coliform levels and dissolved oxygen excursions on numerous occasions, and scattered elevated nutrient levels. The upstream Bear Creek site is impacted by agricultural activities, and Department water samples indicate elevated fecal coliform levels on numerous occasions, and scattered dissolved oxygen excursions. The downstream Bear Creek site is impacted by urban runoff, and water samples indicate scattered elevated nutrient levels and dissolved oxygen excursions. Gills Creek is impacted by urban runoff. Department water samples indicate elevated fecal coliform levels on numerous occasions, and scattered excursions of pH and dissolved oxygen. Both Bear and Gills Creeks are included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants.

Landfill Activities

There are four active construction landfills in this watershed.

Growth Potential

The City of Lancaster is located in this watershed, and has densely developed areas of residential, commercial, and industrial land uses. The City of Lancaster is in the process of expanding the WWTF to 7.5 MGD and relocating the outfall to the Catawba River. This will allow for increased industrial and municipal flows. A large area of residential development extends into the countryside to the south of the city, and also along S.C. 9 and S.C. 903 to the east and U.S. 521 and S.C. 200 to the north. Significant industrial and commercial growth is occurring on the north side of the city along the S.C. 9 Bypass. Rail lines to the Cities of Rock Hill and Chester run along S.C. 9. Water service is available along major roads throughout the watershed. Sewer service is available in the City of Lancaster, in the residential areas to its south,and along S.C. 903 east of the city. The remainder of the watershed is largely rural with scattered residential development, limited agriculture, and forests.

Implementation Strategy

Aquatic life and recreational uses are impaired for Cane Creek due to low dissolved oxygen concentrations and elevated fecal coliform concentrations from point sources. The dischargers have since been eliminated and water quality conditions should improve. Recreational uses on Gills Creek, Bear Creek, and Rum Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. Bear Creek and Rum Creek are also impaired with low dissolved oxygen concentrations, and Rum Creek with elevated chromium concentrations. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

03050103-050

(Fishing Creek)

General Description

Watershed 03050103-050 is located in York County and consists primarily of ***Fishing Creek*** and its tributaries from its origin to its confluence with Wildcat Creek. The watershed occupies 27,109 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Appling-Hiwassee series. The erodibility of the soil (K) averages 0.25; the slope of the terrain averages 6%, with a range of 2-15%. Land use/land cover in the watershed includes: 6.14% urban land, 22.94% agricultural land, 14.62% scrub/shrub land, 1.54% barren land, 53.86% forested land, and 0.91% water.

Fishing Creek originates near the City of York, and this stream segment accepts drainage from Langham Branch and Hope Branch. There are several lakes and ponds (15-32 acres) used for recreation and flood control, and 28.1 stream miles in this watershed, all classified FW.

Water Quality

Fishing Creek - There are five SCDHEC monitoring sites along this section of Fishing Creek, which was Class A before April, 1992. Recreational uses are not supported at any of the ambient monitoring sites due to fecal coliform bacteria excursions. Aquatic life uses are fully supported at station CW-029, and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations suggest improving conditions. A high concentration of zinc was measured in water in 1991. Aquatic life uses are fully supported at stations CW-031 and CW-642 based on macroinvertebrate community data. Aquatic life uses are fully supported at station CW-005 based on macroinvertebrate community data, physical and chemical data. At the furthest downstream site, aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened by a statistically significant declining trend in dissolved oxygen concentration.

Activities Potentially Affecting Water Quality

Point Source Contributions

Fishing Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform concerns.

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***LIMITATION (EL/WQL)***
COMMENT	
FISHING CREEK	SC0038156
CITY OF YORK/FISHING CREEK PLT	MAJOR MUNICIPAL
PIPE #: 001 FLOW: 2.0	WATER QUALITY
WQL FOR BOD_5, NH3-N, TRC, DO	

FISHING CREEK TRIB SCANA HYDROCARBONS PIPE #: 001 FLOW: 0.01 WQL FOR BOD_5, NH3-N, TRC, DO	SC0046248 MINOR INDUSTRIAL WATER QUALITY
HOPE BRANCH MCAFEE TRAILER PARK PIPE #: 001 FLOW: .018 WQL FOR NH3-N, TRC, DO	SC0027111 MINOR COMMUNITY WATER QUALITY

Nonpoint Source Contributions

Fishing Creek is included on the §319 list as waters impacted by agricultural activities. Water samples collected by the Department indicate elevated fecal coliform levels on numerous occasions, and scattered elevated levels of toxic materials (zinc) and total nitrogen, and scattered dissolved oxygen excursions. Computer modeling indicates a high potential for NPS problems from agricultural activities for this stream. Fishing Creek is also included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants.

Landfill Activities

There is one active construction landfill in this watershed in addition to those listed below.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
YORK COUNTY LANDFILL MUNICIPAL	DWP-103 ACTIVE

Growth Potential

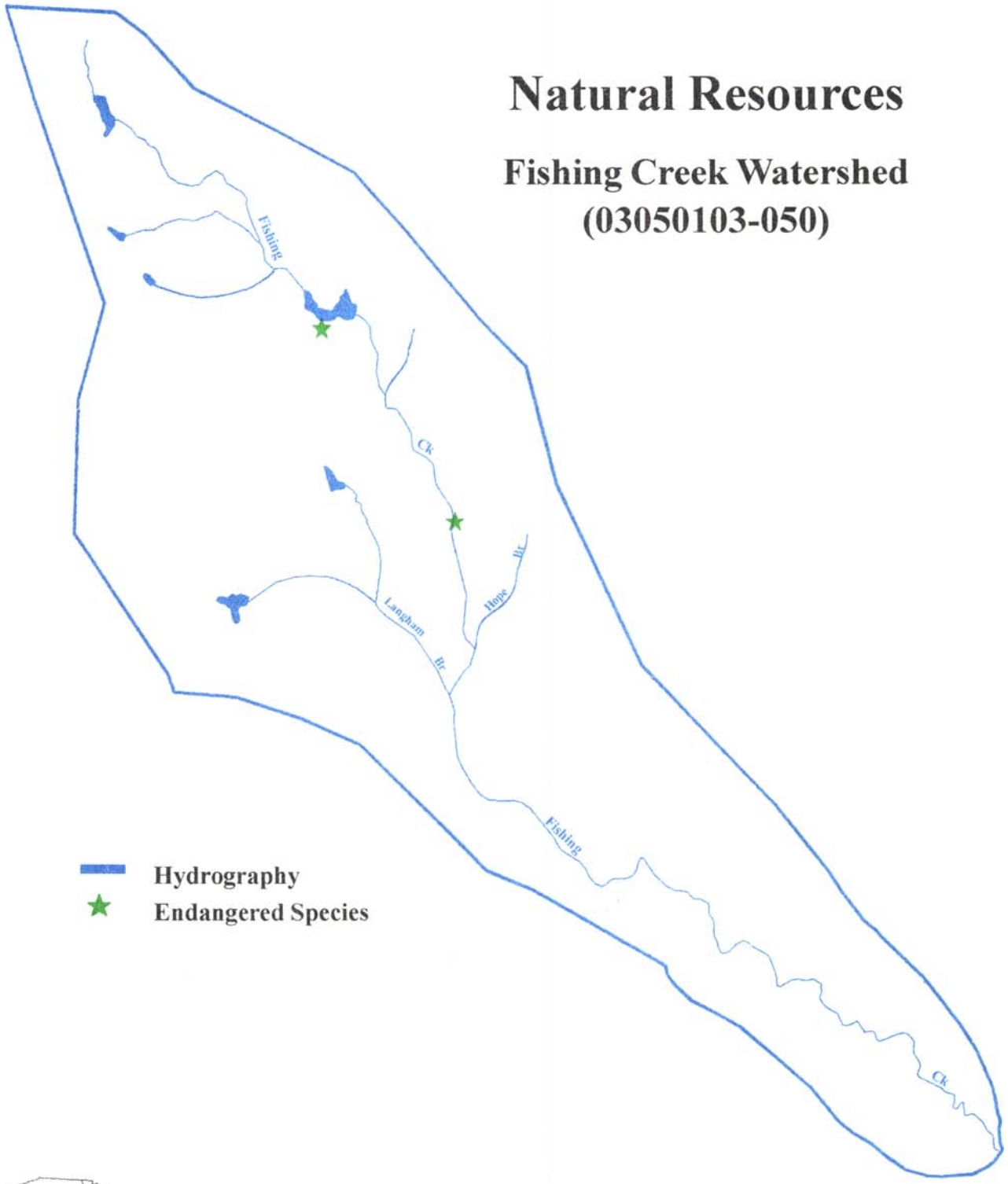
The majority of growth in this watershed is concentrated around the City of York. Water and sewer service are available in York and in several surrounding areas. The East York Industrial Park is a factor in the future development of the area. Another factor that may promote growth include the rail lines from York to the Cities of Rock Hill, Columbia, and Charlotte.

Implementation Strategy

Recreational uses on this upper portion of Fishing Creek is impaired by elevated levels of fecal coliform bacteria due to point sources. The point source permits are being revised and the bacterial condition is expected to improve with the new NPDES permit limits.

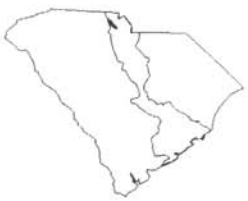
Natural Resources

Fishing Creek Watershed
(03050103-050)



Hydrography

Endangered Species

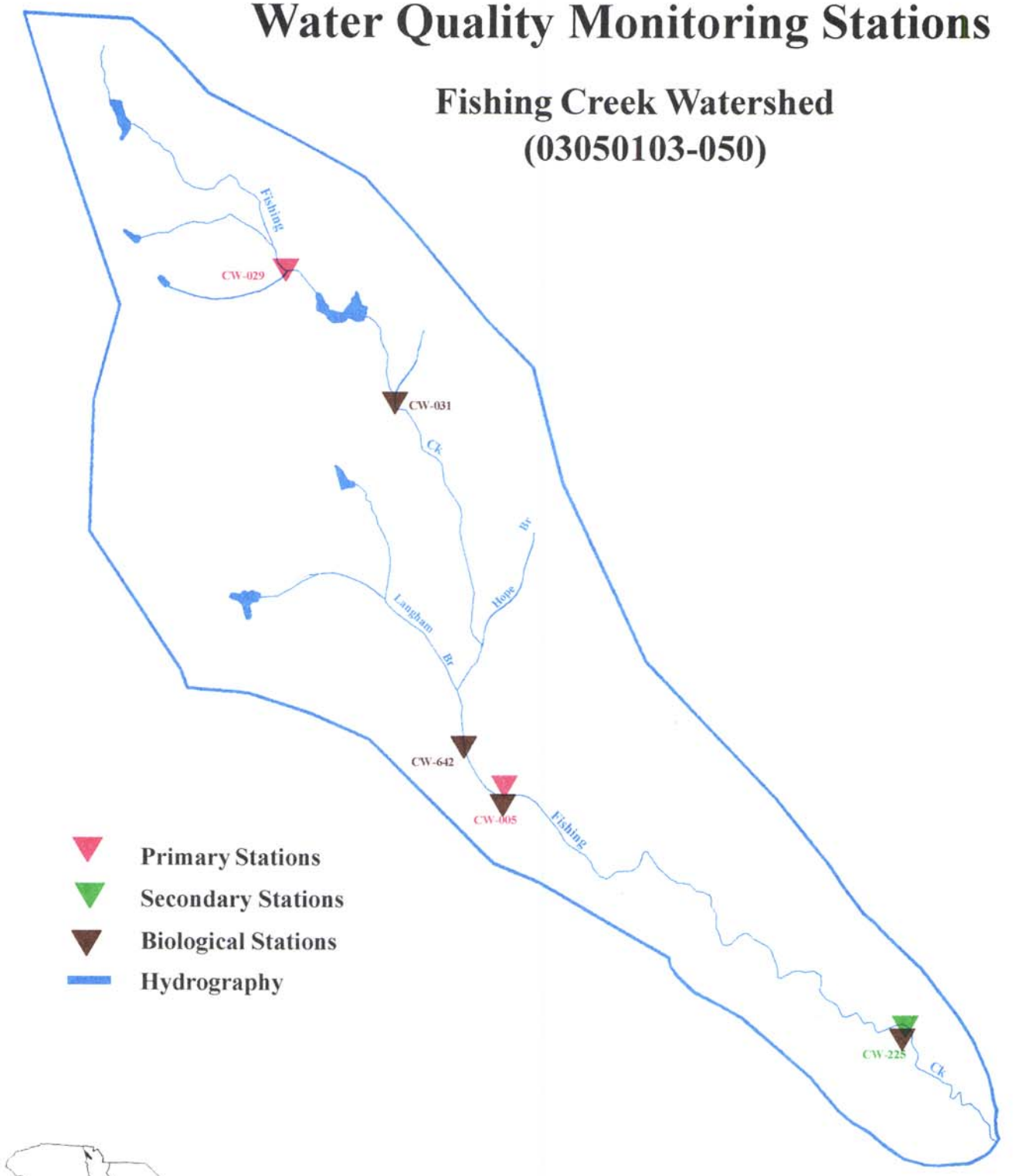


SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Water Quality Monitoring Stations

Fishing Creek Watershed
(03050103-050)

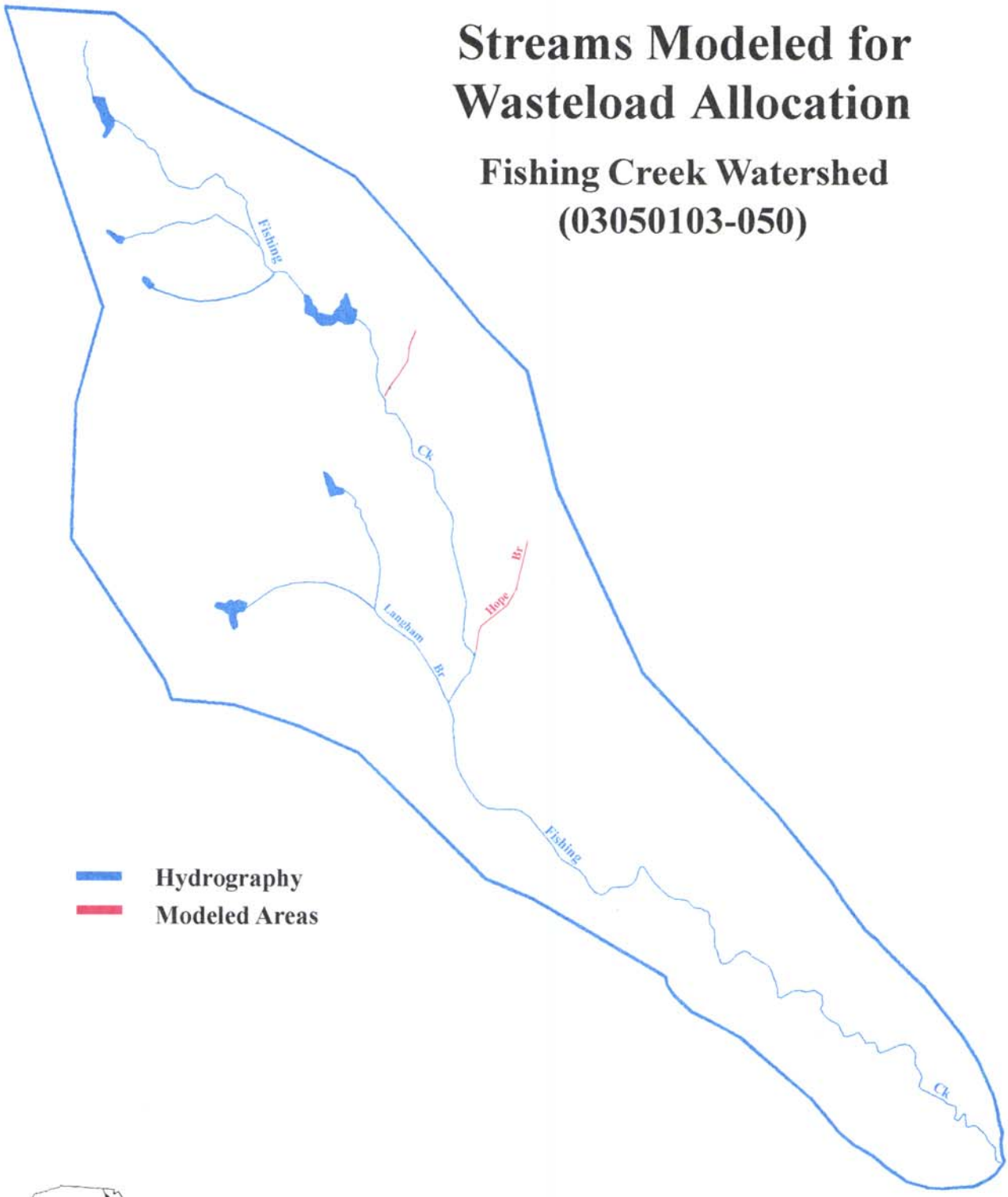


SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Streams Modeled for Wasteload Allocation

Fishing Creek Watershed (03050103-050)



Hydrography

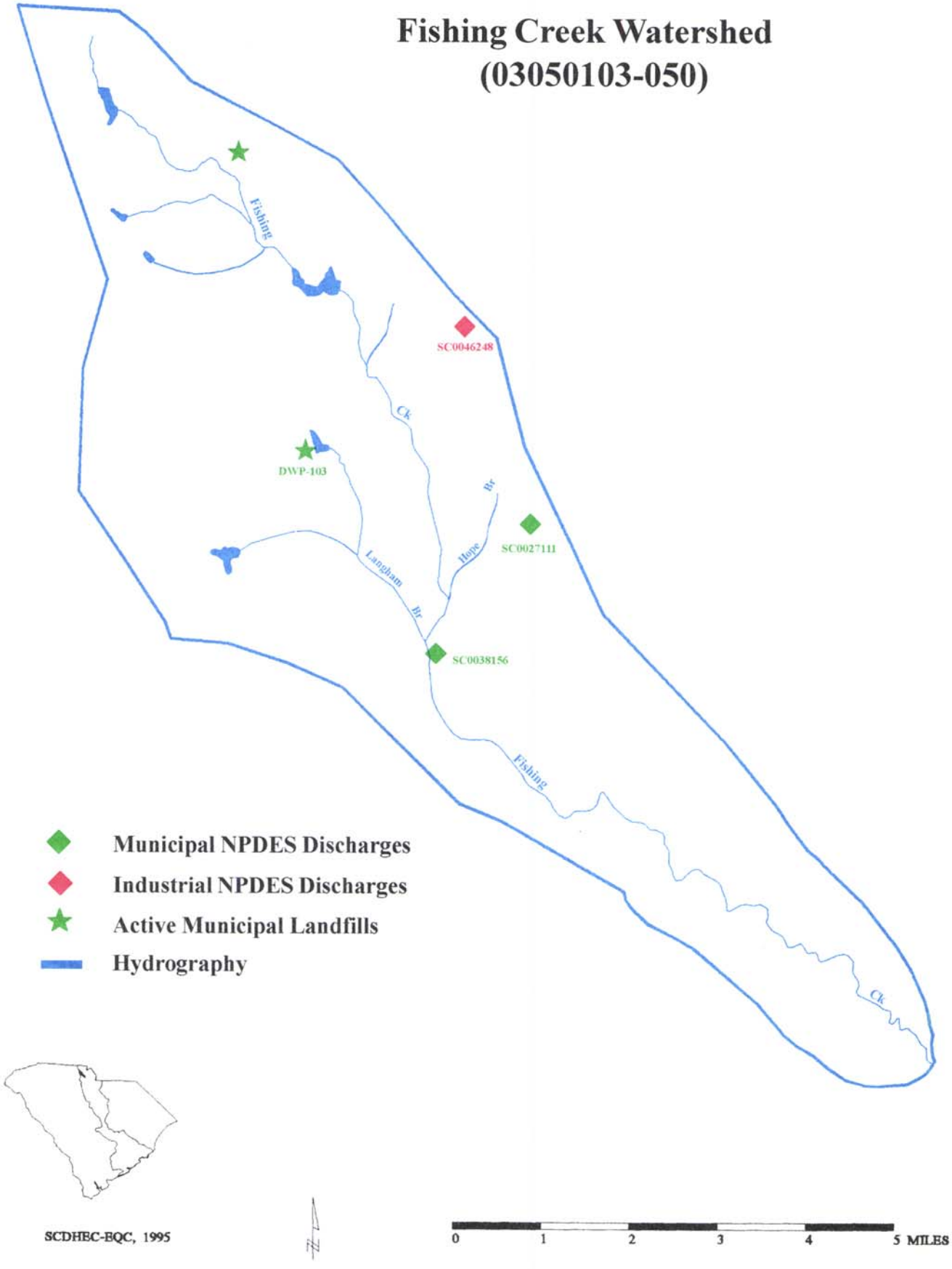
Modeled Areas

SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Activities Potentially Affecting Water Quality

Fishing Creek Watershed
(03050103-050)



03050103-060

(Fishing Creek)

General Description

Watershed 03050103-060 extends through York and Chester Counties and consists primarily of ***Fishing Creek*** and its tributaries from Wildcat Creek to Cedar Creek Reservoir. The watershed occupies 142,339 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Mecklenburg-Iredell series. The erodibility of the soil (K) averages 0.22; the slope of the terrain averages 8%, with a range of 2-25%. Land use/land cover in the watershed includes: 5.77% urban land, 17.38% agricultural land, 13.11% scrub/shrub land, 1.32% barren land, 61.43% forested land, and 0.99% water.

This segment of Fishing Creek accepts the drainage from the upper reach (03050103-050) and from Wildcat Creek (Tools Fork, Dye Creek), which originates near the City of Rock Hill. Taylor Creek enters Fishing Creek downstream of Wildcat Creek, followed by Stoney Fork, Browns Branch, and Clinton Branch. Further downstream, South Fork Fishing Creek (Love Creek, Conrad Creek) merges with Fishing Creek followed by Hicklin Branch (McFadden Branch), the Tinkers Creek watershed (03050103-070), Reeves Creek, and Dairy Branch near the Town of Fort Lawn. Lake Oliphant (40 acres) is located on a tributary to Conrad Creek and is used for recreational purposes. There are several other ponds and lakes in the watershed (10-25 acres) used for irrigation and recreation. Fishing Creek empties into and forms the headwaters of Cedar Creek Reservoir. There are a total of 180.2 stream miles in this watershed, all classified FW.

Water Quality

Fishing Creek - There are four SCDHEC monitoring sites along this section of Fishing Creek, which was Class B until April, 1992. Bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. At the upstream site (which was Class A before April, 1992), aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened due to an elevated concentration of chromium measured in 1993 water samples. In the 1990 sediment sample, a high concentration of copper and a very high concentration of nickel were measured. In the 1993 sediment sample, high concentrations of chromium and zinc were measured, and the nickel concentration was very high. Recreational uses are not supported at this station due to fecal coliform bacteria excursions.

Aquatic life uses are fully supported at the next site downstream (CW-654) based on macroinvertebrate community data. Aquatic life uses are also fully supported at station CW-008 further downstream. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions. A high concentration of zinc was measured in 1993 water samples. Recreational uses are not supported at this site due to fecal coliform bacteria excursions under Class FW standards, compounded by a statistically significant increasing trend in fecal coliform bacteria concentration. At the furthest downstream site, aquatic life

uses are fully supported. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions under Class FW standards.

Wildcat Creek - There are three SCDHEC monitoring sites along Wildcat Creek, which was Class B until April, 1992. Recreational uses are not supported at any site due to fecal coliform bacteria excursions under Class FW standards. Aquatic life uses are fully supported at the upstream site, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. PCB-1242 was detected in 1992 sediment samples, and PCB-1248 and PCB-39507 were detected in 1993. A special investigation detected PCBs in sediment upstream of the monitoring site. A source was not identified and monitoring is continuing. Aquatic life uses are fully supported at the midstream site based on macroinvertebrate community data. At the downstream site, aquatic life uses are fully supported based on macroinvertebrate community data, together with physical and chemical data. A significantly increasing trend in dissolved oxygen and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions.

Tools Fork - Aquatic life uses are fully supported, and a significantly increasing trend in dissolved oxygen and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. Recreational uses are not supported at this site, but a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions. This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed.

Lake Oliphant - Categorized as a minor lake, Lake Oliphant has a watershed extending over 1.1 km^2, a surface area of 16.2 hectares, and a maximum and mean depth of 6.7m and 1.7m, respectively. There are no impaired recreational usages of the lake. Eutrophication studies classified the lake as Category I for excessive nutrients and high productivity. Lake Oliphant is managed by SCDNR and the productivity seen may be a result of purposeful fertilization. Grass carp were introduced into Lake Oliphant in 1992 as a biological control of aquatic plants, at the stocking rate of 20 fish/vegetated acre for a total of 500 fish, to provide public access for boating and fishing.

Activities Potentially Affecting Water Quality

Point Source Contributions

Tools Fork and Wildcat Creek are both included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform concerns.

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***LIMITATION (EL/WQL)***
COMMENT	

FISHING CREEK CITY OF CHESTER/MANETTA PLT PIPE #: 001 FLOW: .50 WQL FOR NH3-N, TRC, DO	SC0001741 MINOR MUNICIPAL WATER QUALITY
FISHING CREEK TRIB LEWISVILLE MIDDLE SCHOOL PIPE #: 001 FLOW: .010 WQL FOR NH3-N, TRC, DO	SC0032336 MINOR COMMUNITY WATER QUALITY
TOOLS FORK COUNTRY OAKS SD PIPE #: 001 FLOW: .020 WQL FOR BOD_5, NH3-N, TRC, DO	SC0039217 MINOR COMMUNITY WATER QUALITY
TOOLS FORK TRIB ADNAH RD MHP/BLUE RIDGE PIPE #: 001 FLOW: .040 WQL FOR BOD_5, NH3-N, TRC, DO UNCONSTRUCTED	SC0041670 MINOR COMMUNITY WATER QUALITY
DYE CREEK SPRINGS IND./ROCK HILL PRINTING & FINISHING PIPE #: 001 FLOW: M/R	SC0029378 MINOR INDUSTRIAL EFFLUENT
TAYLOR CK MARTIN MARIETTA/ROCK HILL QUARRY PIPE #: 001 FLOW: M/R	SC0035513 MINOR INDUSTRIAL EFFLUENT
CLINTON BRANCH PINETUCK SD PIPE #: 001 FLOW: .150 WQL FOR BOD_5, NH3-N, TRC, DO UNCONSTRUCTED	SC0041203 MINOR COMMUNITY WATER QUALITY
CLINTON BRANCH KENTUCKY-CUMBERLAND COAL CO. PIPE #: 001 FLOW: M/R	SC0042129 MINOR INDUSTRIAL EFFLUENT
HICKLIN BRANCH EDGEMOOR COMM. ACTION PIPE #: 001 FLOW: .012 WQL FOR BOD_5, NH3-N, TRC, DO	SC0032344 MINOR COMMUNITY WATER QUALITY

Nonpoint Source Contributions

Fishing Creek, Wildcat Creek, and Tools Fork are all included on the §304(l) long list due to concerns for nontoxic pollutants. Fishing Creek is included on the §319 list of waters impacted by agricultural activities. Water samples collected by the Department indicate elevated fecal coliform levels on numerous occasions, and scattered elevated levels of toxic materials (chromium, copper, nickel, zinc) and nutrients. Computer modeling indicates a high potential for NPS problems from agricultural activities for this stream. Tools Fork is also impacted by agricultural activities, and Department water samples indicate numerous fecal coliform excursions. Wildcat Creek is impacted

by urban runoff, and water samples indicate numerous fecal coliform excursions together with scattered elevated levels of toxic materials (PCBs).

Landfill Activities

There are two unpermitted landfills (one active, one closed) in this watershed.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CITY OF ROCK HILL CONSTRUCTION	CWP-025 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME* *COMMENTS*	*PERMIT #* *MINERAL*
REA CONSTRUCTION CO. FISHING CREEK MINE INSTREAM DREDGING	0178-12 SAND
LINEBERGER GRADING & PAVING WALLACE SAND PIT INSTREAM DREDGING	0605-12 SAND
MARTIN MARIETTA AGGREGATES ROCK HILL QUARRY	0104-46 GRANITE

Growth Potential

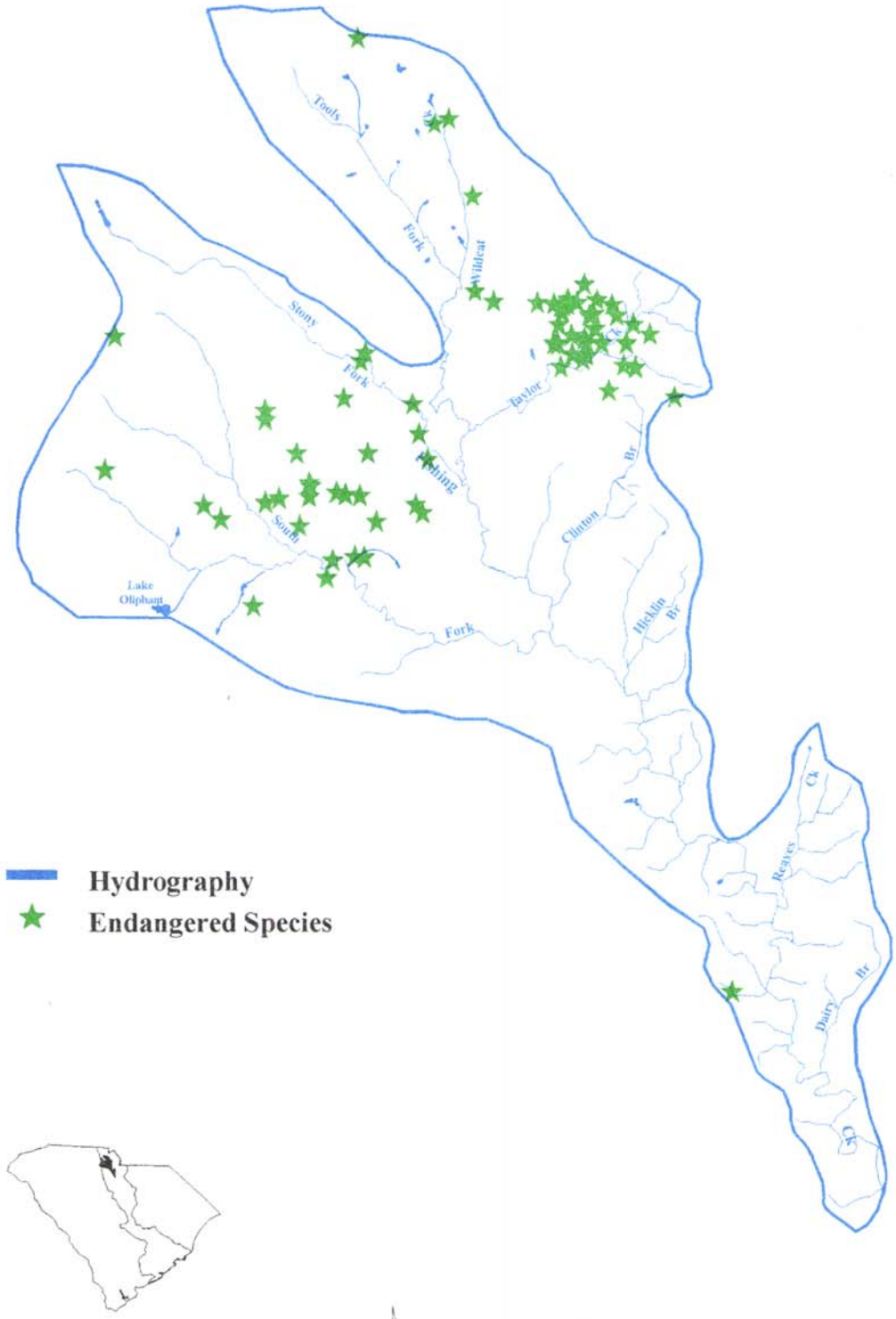
The major development factor in this watershed is the southern and western portions of the City of Rock Hill. Portions of the Towns of McConnells, Lowrys, Richburg, Fort Lawn, and Great Falls together with the unincorporated communities of Edgemoor and Lando are also located in this watershed. Water and sewer services are limited to the areas around Rock Hill and the S.C. 9 corridor in Chester County. Some industrial development occurs along the S.C. 9 corridor. I-77 extends through the area, but there is only one interchange and it has no utilities. The area around McConnells and Lowrys has a high level of agricultural activity. The potential for future development is greatest near the Rock Hill area and the S.C. 9 corridor. The City of Chester has proposed expanding facilities that discharge to Fishing Creek in order to serve the growth of the area.

Implementation Strategy

Recreational uses on this lower portion of Fishing Creek is impaired by elevated levels of fecal coliform bacteria due to point sources. The point source permits are being revised and the bacterial condition is expected to improve with the new NPDES permit limits. Recreational uses for Wildcat Creek and Tools Fork are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

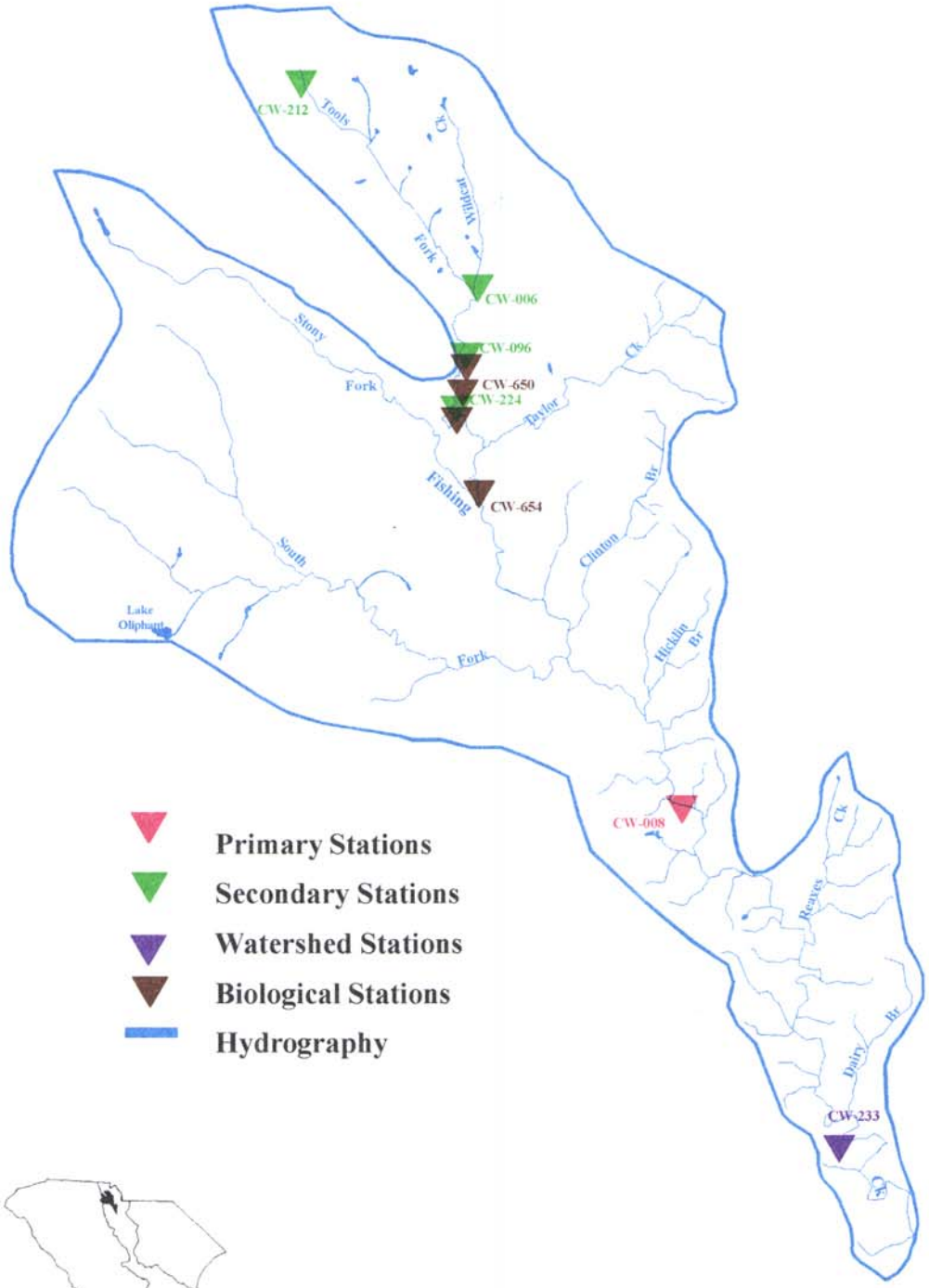
Natural Resources

Fishing Creek Watershed
(03050103-060)



Water Quality Monitoring Stations

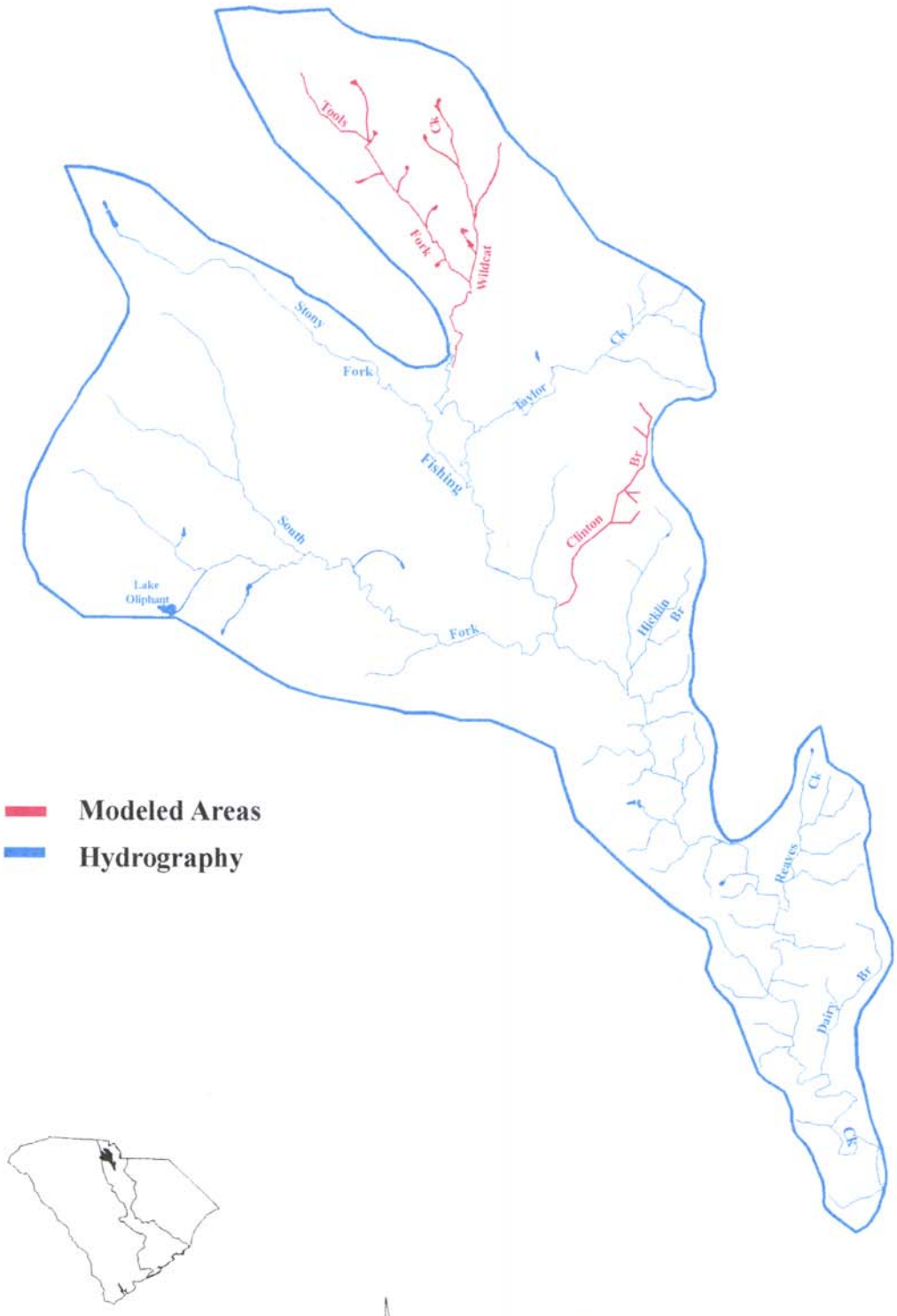
Fishing Creek Watershed
(03050103-060)



SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Fishing Creek Watershed
(03050103-060)



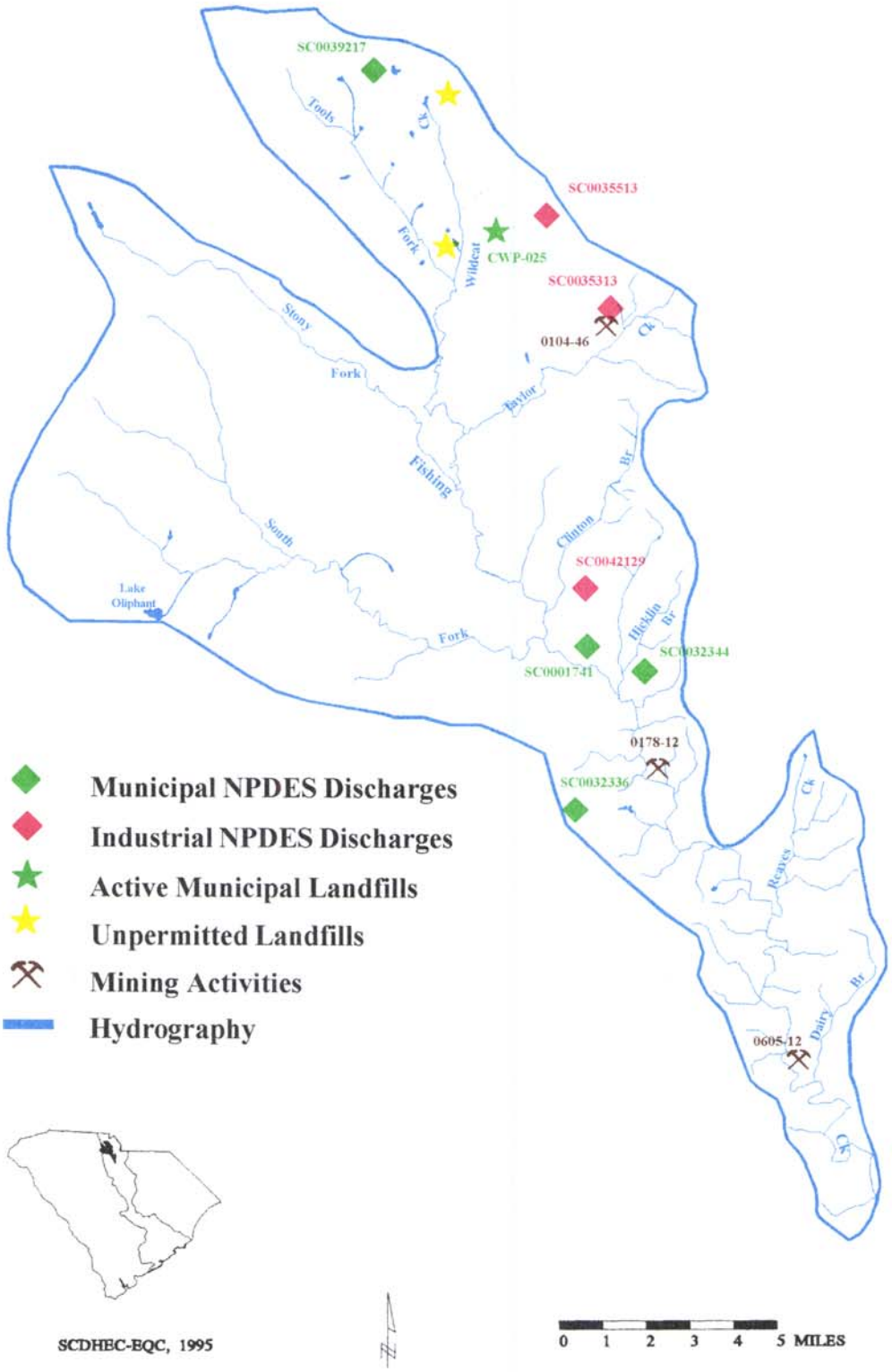
SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Activities Potentially Affecting Water Quality

Fishing Creek Watershed

(03050103-060)



03050103-070

(Tinkers Creek)

General Description

Watershed 03050103-070 is located in York and Chester Counties and consists primarily of ***Tinkers Creek*** and its tributaries. The watershed occupies 14,903 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Pacolet-Cecil-Wilkes-Madison series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 10%, with a range of 2-40%. Land use/land cover in the watershed includes: 0.42% urban land, 11.28% agricultural land, 10.12% scrub/shrub land, 0.05% barren land, 77.23% forested land, and 0.88% water.

Tinkers Creek accepts the drainage of Rum Branch and Neelys Creek, and flows through a 55-acre pond used for flood control and recreation, before draining into Fishing Creek. There are a total of 43.1 stream miles in this watershed, all classified FW.

Water Quality

Tinkers Creek - Aquatic life uses are fully supported at this site, but recreational uses are only partially supported due to fecal coliform bacteria excursions.

Neelys Creek - Aquatic life and recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
NEELYS CREEK NEELYS CREEK RETIREMENT HOME PIPE #: 001 FLOW: .008 WQL FOR NH3-N, TRC	SC0041904 MINOR COMMUNITY WATER QUALITY
NEELYS CREEK TRIB JACK NELSON ENTERPRISES PIPE #: 001 FLOW: .012 WQL FOR NH3-N, TRC, DO	SC0027341 MINOR COMMUNITY WATER QUALITY

Growth Potential

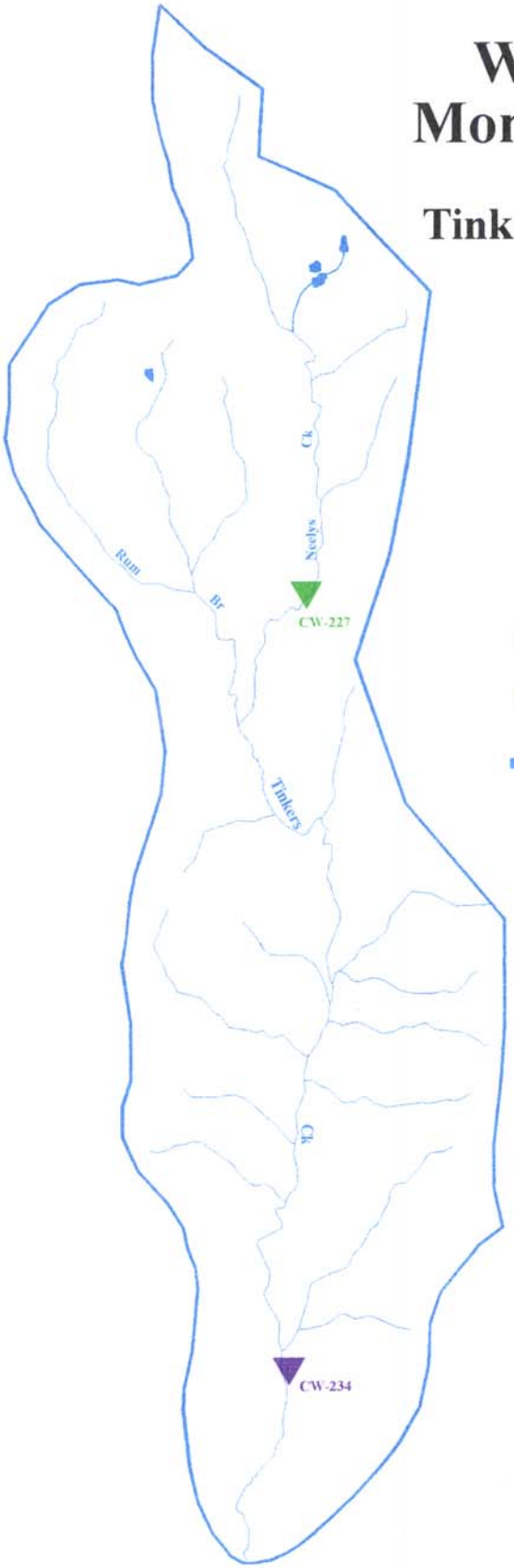
This watershed is primarily rural, with some residential density in the extreme northern section as a result of the City of Rock Hill. Water service is available only in this limited area, otherwise no utilities are available, and there is little indication of future growth. There are substantial areas of forests, with some forestry activity.

Implementation Strategy

Recreational uses for Tinkers Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

Water Quality Monitoring Stations

Tinkers Creek Watershed (03050103-070)



Secondary Stations

Watershed Stations

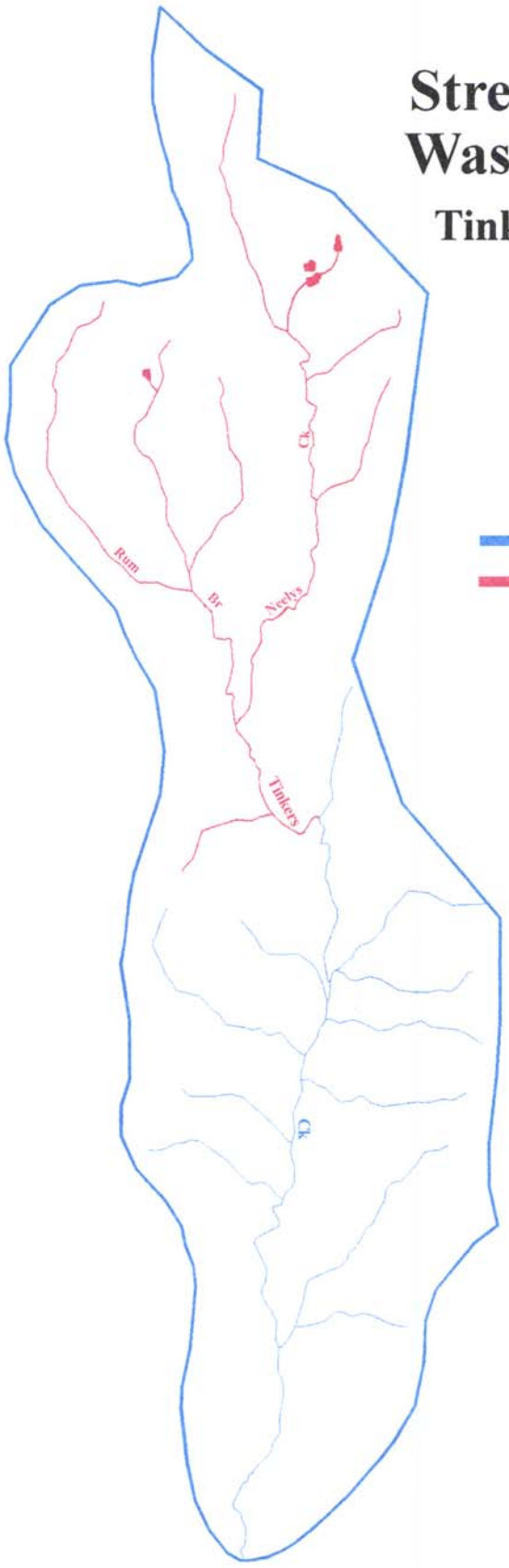
Hydrography

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

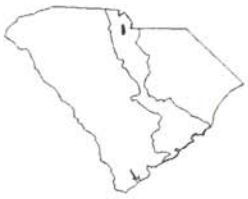
Streams Modeled for Wasteload Allocation

Tinkers Creek Watershed (03050103-070)



Hydrography

Modeled Areas

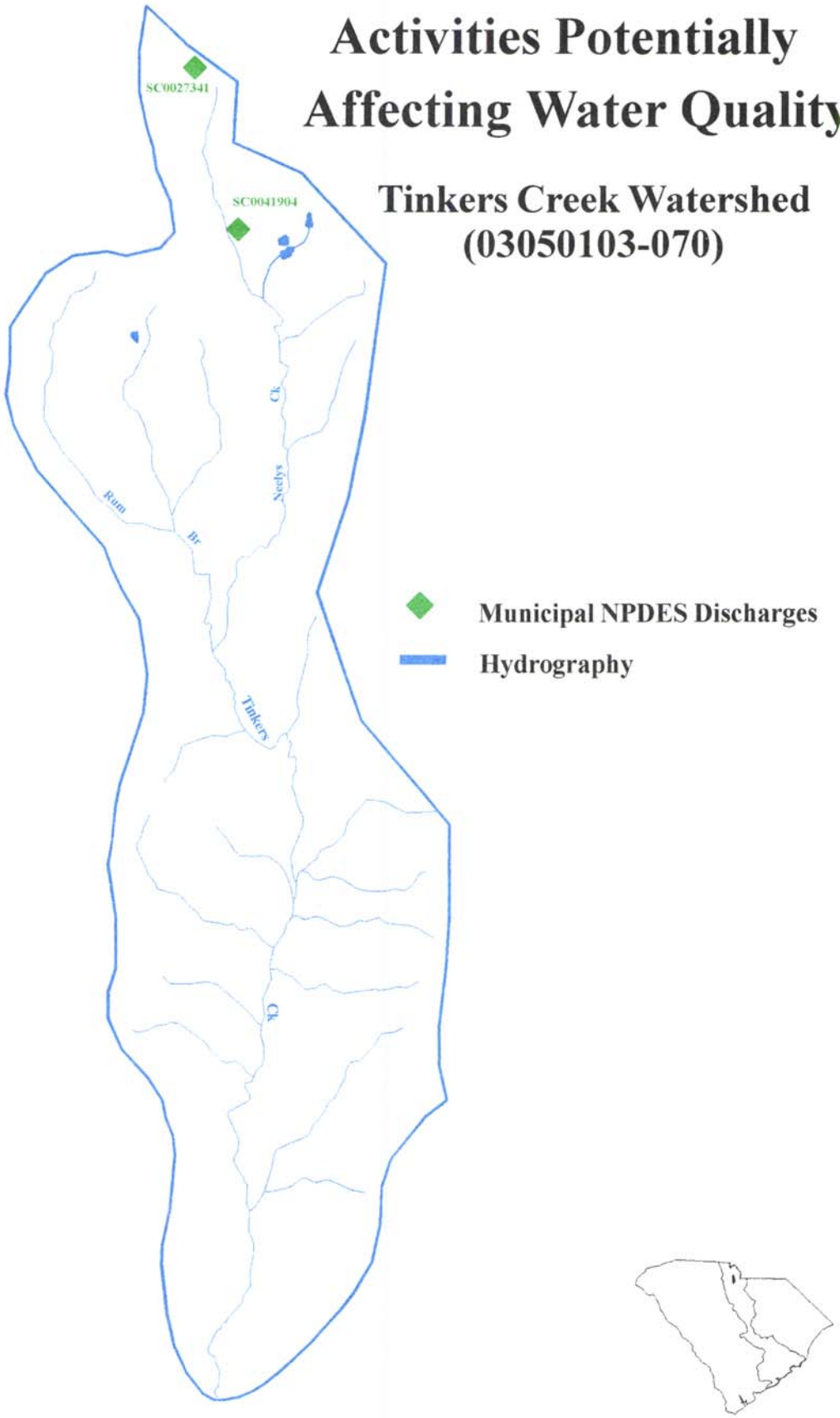


0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality

Tinkers Creek Watershed (03050103-070)



SCDHEC-BQC, 1995

03050103-080

(Camp Creek)

General Description

Watershed 03050103-080 is located in Lancaster County and consists primarily of ***Camp Creek*** and its tributaries. The watershed occupies 21,989 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Helena-Pacolet-Cecil series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 0.02% urban land, 6.58% agricultural land, 2.99% scrub/shrub land, 0.58% barren land, 89.45% forested land, 0.22% forested wetland, and 0.17% water. Camp Creek originates near the City of Lancaster and accepts the drainage of Dry Creek before flowing into Cedar Creek Reservoir. There are several recreational ponds and a total of 69.0 stream miles in this watershed, all classified FW.

Water Quality

Camp Creek - Aquatic life uses may be threatened at this site due to a high concentration of chromium measured in 1993 water samples. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Nonpoint Source Contributions

Camp Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform concerns.

Landfill Activities

There is an active construction landfill in this watershed.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
LANCASTER COUNTY LANDFILL MUNICIPAL	DWP-120 ACTIVE

Growth Potential

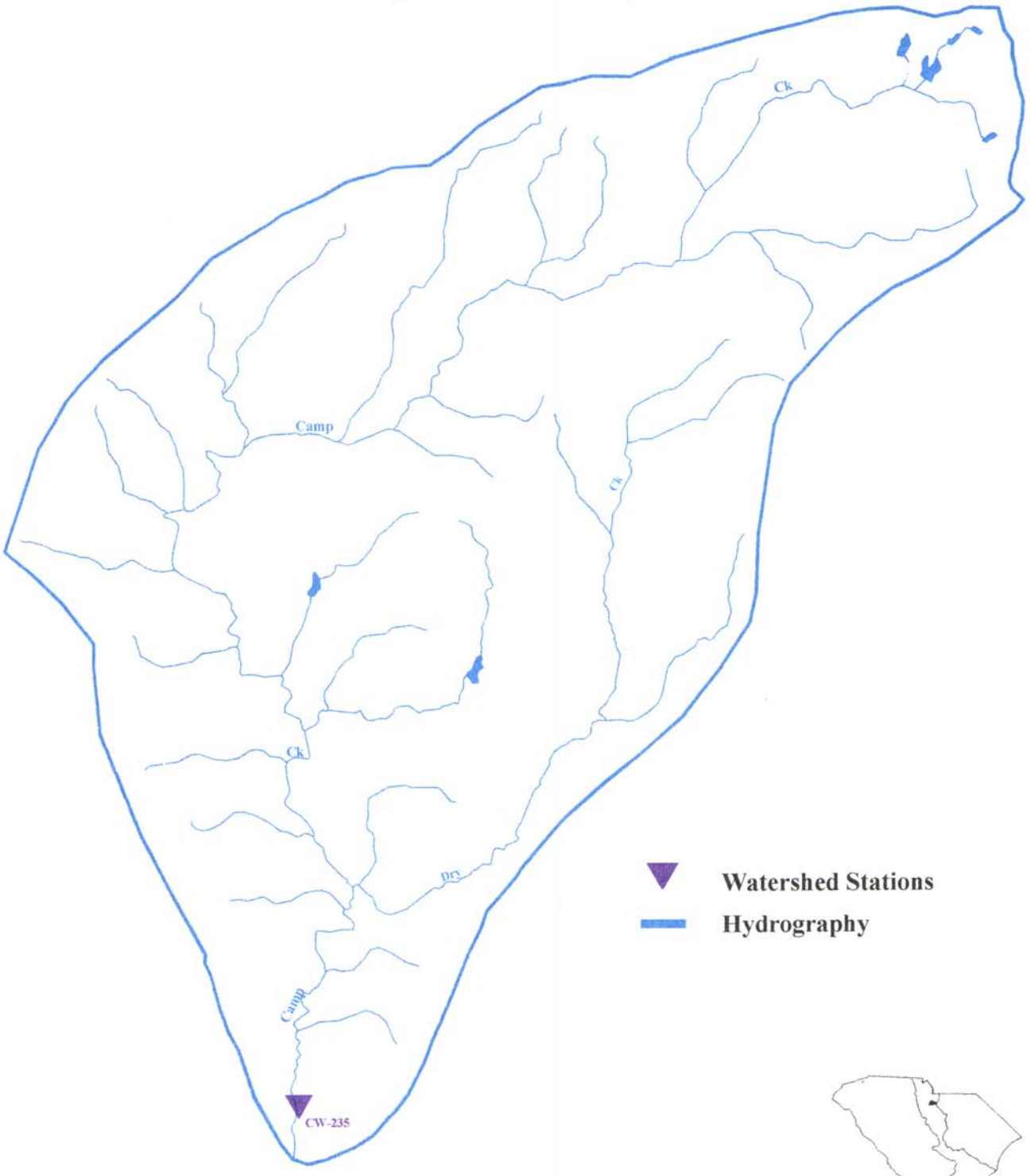
There is a low potential for growth in this watershed.

Implementation Strategy

Recreational uses for Camp Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

Water Quality Monitoring Stations

Camp Creek Watershed
(03050103-080)

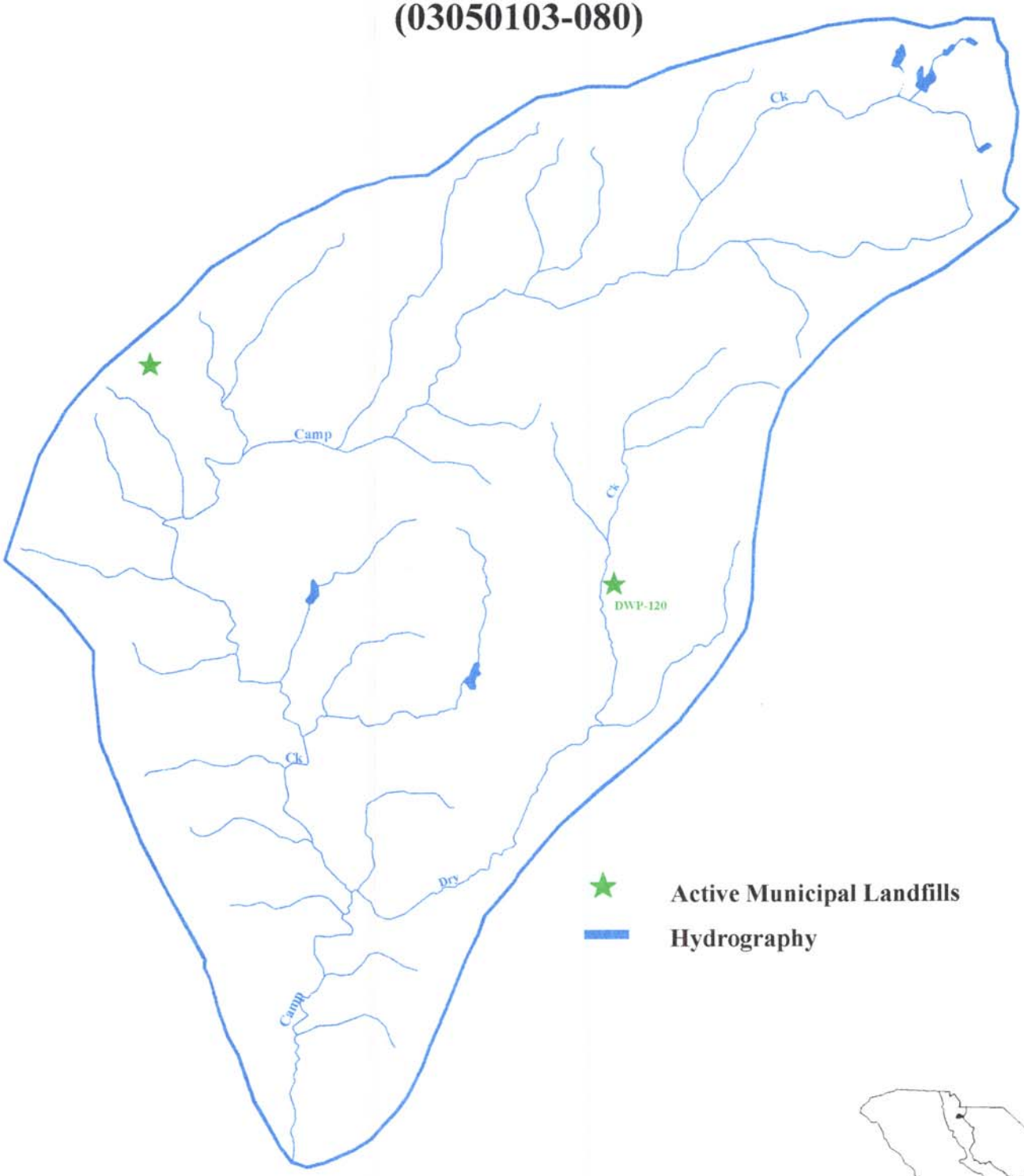


SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality

Camp Creek Watershed

(03050103-080)



03050103-090

(Rocky Creek)

General Description

Watershed 03050103-090 is located in Chester and Fairfield Counties and consists primarily of ***Rocky Creek*** and its tributaries. The watershed occupies 140,112 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Pacolet-Cecil-Madison series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 10%, with a range of 2-40%. Land use/land cover in the watershed includes: 1.88% urban land, 10.25% agricultural land, 8.18% scrub/shrub land, 0.18% barren land, 79.14% forested land, and 0.37% water.

Rocky Creek originates near the Town of Chester and accepts drainage from Grassy Run Branch, Bull Run Creek, Hooper Creek (Melton Branch), Barbers Creek (McDaniels Branch, Waters Branch), and Bull Skin Creek. Further downstream, Beaverdam Creek enters Rocky Creek followed by Little Rocky Creek (Shannon Creek, Bell Creek (Stover Creek), Hodges Branch, and Turkey Branch. Rocky Creek drains into Cedar Creek Reservoir near the Town of Great Falls. There are a total of 176.3 stream miles in this watershed, all classified FW.

Water Quality

Rocky Creek - There are three SCDHEC ambient monitoring network sites along Rocky Creek. Recreational uses are not supported at any site due to fecal coliform bacteria excursions under Class FW standards. This is compounded by a significantly increasing trend in fecal coliform bacteria concentrations at the upstream site. Aquatic life uses are fully supported at the upstream site based on macroinvertebrate community data, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. Aquatic life uses are fully supported at the midstream site, although a high concentration of zinc was measured in water in 1993. At the downstream site, aquatic life uses are also fully supported. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions.

Grassy Run Branch - Aquatic life uses are not supported for this stream due to dissolved oxygen excursions, compounded by a significantly decreasing trend in dissolved oxygen concentration. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. Recreational uses are not supported at this site due to fecal coliform bacteria excursions under Class FW standards. This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed.

Little Rocky Creek - Aquatic life uses are fully supported at this site based on macroinvertebrate community data.

Activities Potentially Affecting Water Quality

Point Source Contributions

Rocky Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
ROCKY CREEK CITY OF CHESTER/ROCKY CREEK PLT PIPE #: 001 FLOW: 1.36 WQL FOR BOD_5, NH3-N, TRC, DO	SC0036056 MAJOR MUNICIPAL WATER QUALITY
ROCKY CREEK TRIB ESSEX GROUP, INC. PIPE #: 001 FLOW: 0.0091	SC0040941 MINOR INDUSTRIAL EFFLUENT
GRASSY RUN BRANCH SPRINGS IND./EUREKA PLANT PIPE #: 001 FLOW: M/R AIRWASH AND CHILLER WATER	SC0003301 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Contributions

Rocky Creek and Grassy Run Branch are both listed as waters impacted by nonpoint sources. Rocky Creek, which is impacted by agricultural activities, is included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants. Water samples collected by the Department indicate elevated fecal coliform levels on numerous occasions, and scattered elevated levels of toxic materials (zinc), nutrients, and BOD_5. Computer modeling indicates a high potential for NPS problems from agricultural activities for this stream. Grassy Run Branch is primarily impacted by urban runoff, and water samples indicate numerous excursions of fecal coliform and dissolved oxygen and scattered elevated BOD_5 and nutrient levels.

Landfill Activities

There is one closed construction landfill in the watershed in addition to those listed below.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
WILLAMETTE INDUSTRIES INDUSTRIAL	IWP-188 ACTIVE
CHESTER COUNTY LANDFILL MUNICIPAL	— CLOSED

Growth Potential

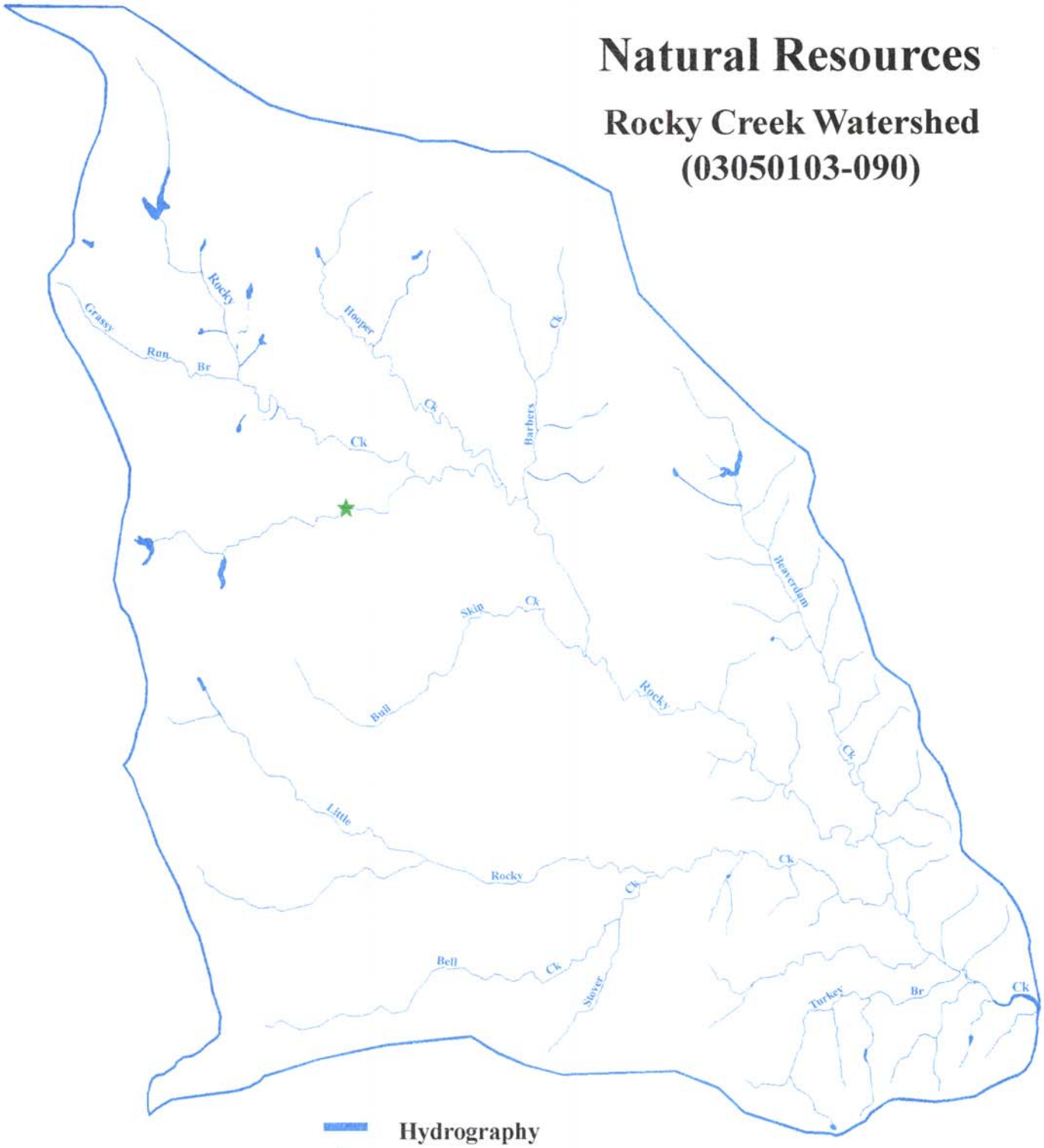
This watershed contains portions of the Towns of Richburg and Great Falls, and the City of Chester. Growth extends north and east of Chester, along York Road and S.C. 72. Industrial and commercial growth has occurred in the Richburg area, associated with the I-77/S.C.9 interchange and the presence of utilities in that area. Water service is available in the Chester area, along S.C.9 through Richburg, and down S.C. 99 to Great Falls. Sewer service exists in the Chester and Richburg areas. The presence of I-77 will have an impact on future growth in the watershed, especially the Richburg area. Another important transportation artery is S.C. 9, which will be widened to four lanes through the area over the next few years. The remainder of the watershed is rural and should see scattered development in the future.

Implementation Strategy

Recreational uses for Rocky Creek are impaired by elevated fecal coliform bacteria concentrations from point and nonpoint sources. The permit for this point source discharger is being revised and the bacterial condition is expected to improve with the new NPDES permit limits. Grassy Run Branch is impaired with low dissolved oxygen and elevated fecal coliform concentrations due to nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the nonpoint source related problems.

Natural Resources

Rocky Creek Watershed
(03050103-090)



Hydrography

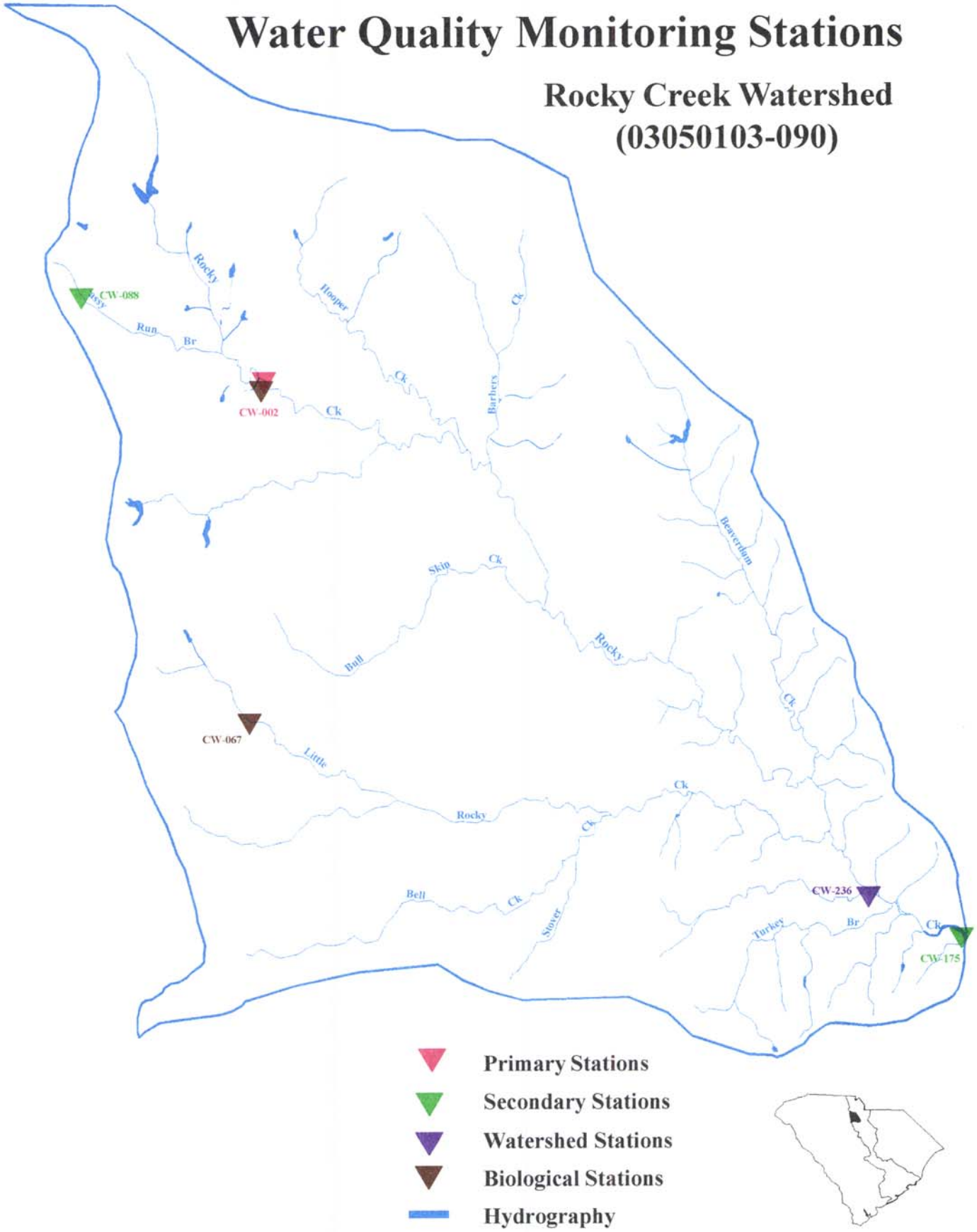
Endangered Species

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

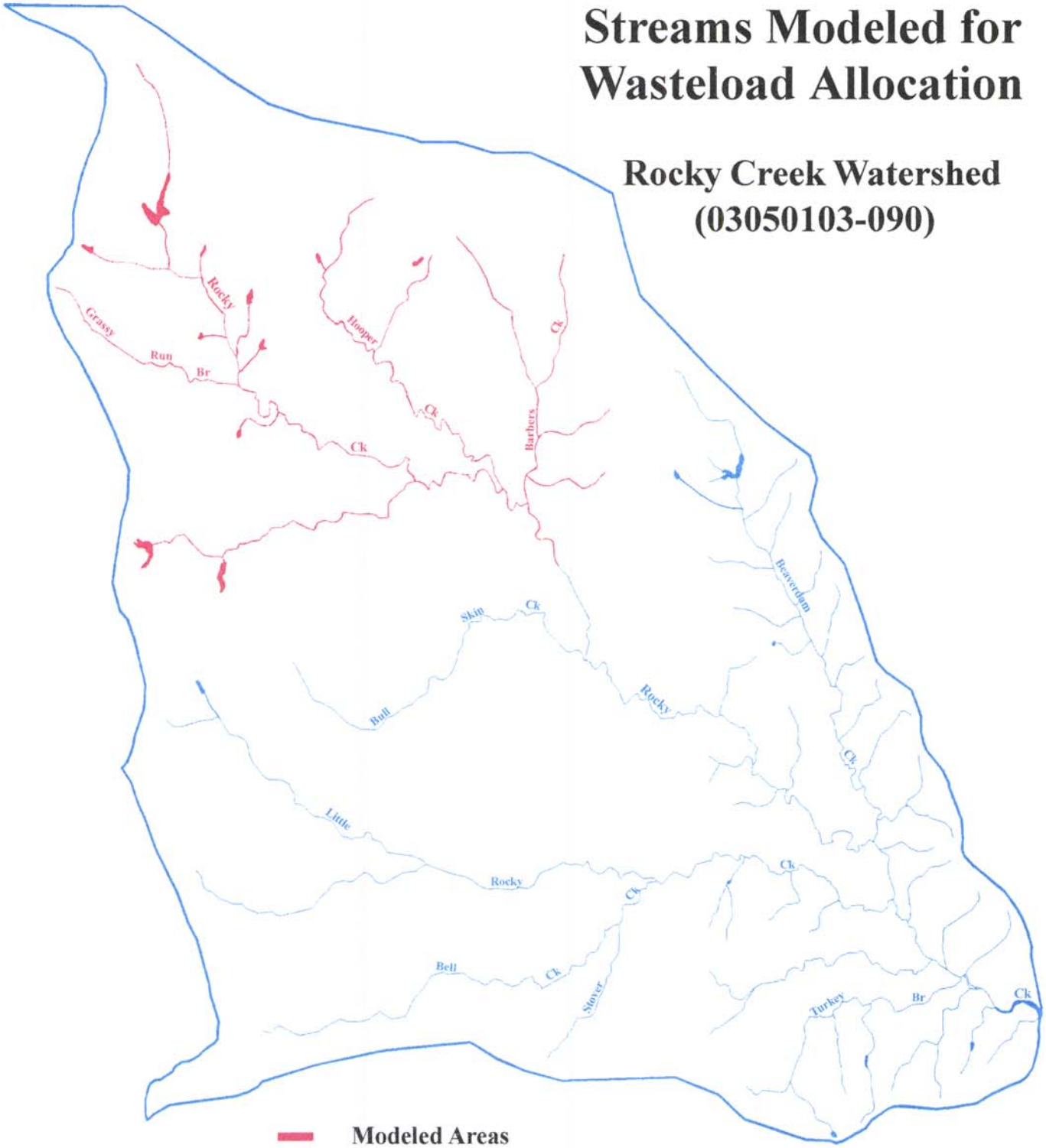
Rocky Creek Watershed
(03050103-090)

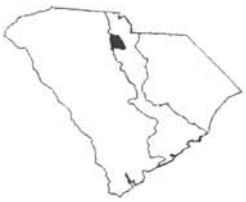


SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Rocky Creek Watershed (03050103-090)



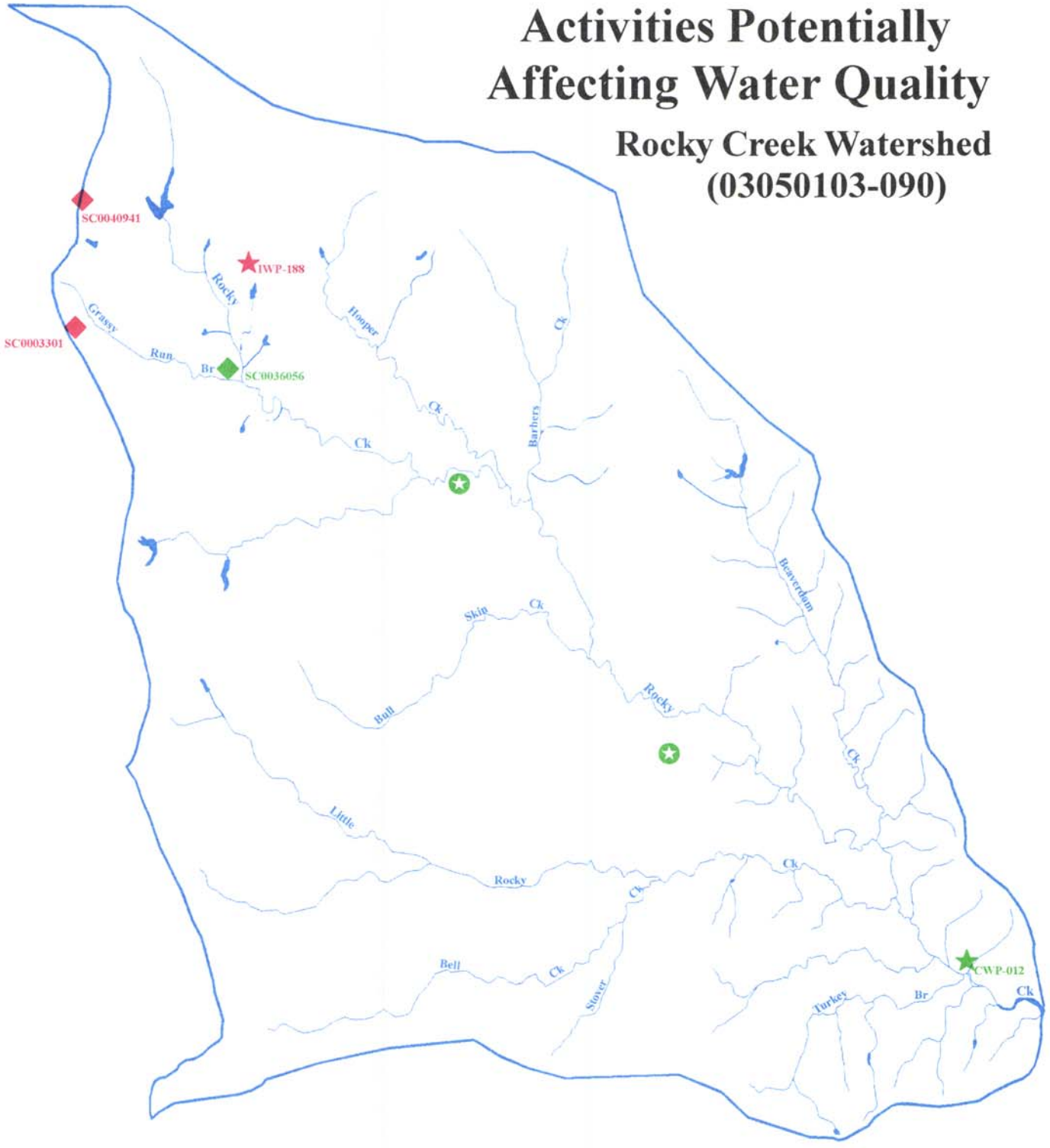


0 1 2 3 4 5 MILES

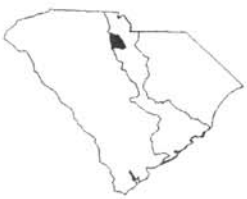
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Rocky Creek Watershed (03050103-090)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Active Municipal Landfills
- Closed Municipal Landfills
- Active Industrial Landfills
- Hydrography



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050104-010

(Wateree River/Wateree Lake)

General Description

Watershed 03050104-010 is located in Fairfield, Kershaw, and Lancaster Counties and consists primarily of the ***Wateree River*** and its tributaries as it flows through Lake Wateree. The watershed occupies 186,916 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Wateree-Rion-Madison series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 17%, with a range of 2-45%. Land use/land cover in the watershed includes: 0.67% urban land, 2.17% agricultural land, 3.70% scrub/shrub land, 0.06% barren land, 85.35% forested land, 1.09% forested wetland, and 6.96% water.

The Catawba River flows out of the Cedar Creek Dam and is joined by Cedar Creek (Bell Branch, Rocky Creek, Gar Creek), McDowell Creek, Crooked Creek, and the Big Wateree Creek watershed (03050104-020) to form the headwaters of the Wateree River and Wateree Lake. Duke Power Company oversees operation of Wateree Lake, which is used for power generation, water supply, and recreational purposes. Little Wateree Creek originates near the Town of Winnsboro and accepts drainage from Horse Creek, McCulley Creek, Ready Creek, Minton Creek (White Oak Branch), and Horse Branch before flowing into the Big Wateree Creek embayment. Langley Branch enters the lake just downstream of the confluence, and Taylor Creek and Dutchmans Creek (Cedar Fork, Lots Fork) form arms of the lake near Wateree Lake State Park. Moving downlake, streams draining into the lake include: Singleton Creek (McDow Creek, Rocky Branch), Rochelle Creek, June Creek, Fox Creek, Beaver Creek (Tranham Creek, Showerbath Branch, Little Beaver Creek), Stillhouse Branch, Colonel Creek, and White Oak Creek. There are a total of 453.8 stream miles in this watershed, all classified FW.

Water Quality

Catawba River - Aquatic life uses are fully supported at the site just downstream of the confluence with Cedar Creek.

Wateree Lake - Categorized as a major lake, Wateree Lake has a watershed covering 863.2 km^2 (up to the Cedar Creek Reservoir Dam), a surface area of 5548.4 hectares, and a maximum and mean depth of 19.5m and 6.9m, respectively. Wateree Lake has a retention time of 27 days. There are no impaired recreational usages of the lake. Eutrophication studies classified the headwaters, Big Wateree Creek arm, and the dam area as Category I for excessive nutrients and high productivity. A Phase I Diagnostic/ Feasibility Study is currently underway. Study objectives are to determine the cause and extent of eutrophication in the lake, with an emphasis on sediment and phosphorus loading. Another objective is to recommend feasible and cost-effective methods for protecting the water quality of Wateree Lake. The study area comprises the entire watershed, from Wateree Lake upstream to the Lake Wylie Dam.

There are three SCDHEC monitoring sites within Wateree Lake, and recreational uses are fully supported at all sites. Despite decreasing trends in total phosphorus and nitrogen concentrations, the rate of decrease is very slow and the lake is still highly productive. Aquatic life uses may not be supported in the Dutchmans Creek arm due to elevated concentrations of cadmium, chromium, copper, and zinc measured in water. This is compounded by significantly increasing trends in pH and turbidity. P,P'DDE (metabolite of DDT) and PCB-1260 were detected in 1989 sediment samples. Although the use of DDT was banned in 1973, it is very persistent in the environment. High zinc concentrations were measured in the 1990 sediment sample, and high concentrations of chromium, copper, and zinc were measured in the 1992 samples. The 1993 sediment samples detected PCB-1242.

Aquatic life uses at the midlake site may not be supported due to elevated concentrations of heavy metals in both water and sediment. In water, high concentrations of zinc were measured in 1991 and 1993, and copper was high once in 1991, and very high once in 1993. In the 1989 sediment sample, high concentrations of chromium, copper, nickel, and zinc were measured together with PCB-1260. In the 1990 sediment sample, high concentrations of copper and nickel, and very high concentrations of chromium and zinc were measured. High concentrations of chromium, copper, and nickel were measured in the 1992 sediment sample, together with very high zinc concentrations.

Nearer the dam, aquatic life uses are partially supported due to a significantly declining trend in dissolved oxygen concentration, compounded by high concentrations of zinc measured in water in 1990 and 1991. In addition to decreasing trends of phosphorus and nitrogen, a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this region of the lake. In the 1989 sediment sample, copper, nickel, and zinc concentrations were high, and chromium concentration was very high. Chromium, copper and zinc concentrations were high in the 1990 sediment samples. P,P'DDT and P,P'DDE were detected in sediment in 1993. Recreational uses are fully supported, but are threatened by a significantly increasing trend in fecal coliform bacteria concentrations.

The metals concentration in Wateree Lake sediment is high relative to freshwater streams in South Carolina; however, it is similar to values seen in other lakes in the State. Lakes act as settling basins for materials entering the system directly from a discharge or indirectly from the land surface washed into streams. Therefore, it is not unusual for lake sediment concentrations to be higher than sediment concentrations found in streams. This is especially true for chromium, copper, and zinc. The concentrations seen in Wateree Lake are very similar to, or in many cases lower than, concentrations seen in Rhodhiss Lake and Lake Hickory, two lakes in the upper portion of the Catawba River (Jaynes 1994). It is recognized that aerial deposition is a potentially significant source of these metals.

Fish tissue samples were collected as part of the Wateree Lake Diagnostic/Feasibility Study (SCDHEC 1996), and independently by Duke Power Company as part of their assessment of the Catawba River (Coughlan 1995). Both sets of samples were analyzed for a wide range of contaminants, which included metals, PCBs, and DDT and DDT metabolites. No contaminants were

measured at levels that pose a threat to human health through the consumption of fish. In addition to fish tissue analyses, Duke Power Company also conducted a fish health assessment of largemouth bass to determine if the fish population itself was suffering impacts from contaminants or other environmental stressors. The fish health assessment scores for two sites on Wateree Lake were very close to the average for South Carolina (Coughlan 1995) and well below the value indicating stressful conditions in reservoirs of the Southeastern United States (Brown 1993).

Little Wateree Creek - Aquatic life uses are fully supported, and a significantly decreasing trend in total phosphorus concentration suggests improving conditions. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
WATEREE LAKE NOSCA PINE RANCH	28-NO5 ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

Wateree Lake is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen, pH, and nutrient concerns. The Big Wateree Creek arm and the dam area are also on the §303(d) low priority list of waters for nutrient concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
WATEREE LAKE CAROLINA 7TH DAY/NOS PIPE #: 001 FLOW: .025	SC0033651 MINOR COMMUNITY EFFLUENT
WATEREE LAKE JONES & FRANK CORP. PIPE #: 001 FLOW: M/R	SC0042048 MINOR INDUSTRIAL EFFLUENT
WATEREE LAKE US AIR FORCE/WATEREE RECREATION PIPE #: 001 FLOW: .01	SC0044440 MINOR INDUSTRIAL EFFLUENT
READY CREEK RICHARD WINN ACADEMY PIPE #: 001 FLOW: .00375 WQL FOR NH3-N, TRC, DO	SC0028134 MINOR COMMUNITY WATER QUALITY

Nonpoint Source Contributions

Both Wateree Lake and Little Wateree Creek are included on the §319 list of waters impacted by agricultural activities, and the §304(l) long list of waters impacted by nontoxic pollutants. Water samples collected by the Department from Wateree Lake indicate elevated nutrient levels and toxic materials (cadmium, chromium, copper, zinc, PCBs, nickel) on numerous occasions, and scattered elevated turbidity levels and excursions of dissolved oxygen and pH. Department water samples from Little Wateree Creek indicate elevated fecal coliform and nutrient levels on numerous occasions.

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
FAIRFIELD COUNTY DR. FLOYD PIT	0332-20 SAND
FAIRFIELD COUNTY CARLISLE PIT	0336-20 SAND
FAIRFIELD COUNTY ROCHELLE MINE	0848-20 CLAY
GRANITE PANELWALL COMPANY CAROLINA DIAMOND GRAY QUARRY	0012-28 GRANITE
GEORGIA STONE, INC. SOUTH CAROLINA GRANITE MINE	0556-28 GRANITE
CAROLINA QUARRIES CONGAREE QUARRY	0405-29 GRANITE

Ground Water Concerns

The ground water located in the area of the above ground storage tanks owned by Winnsboro Petroleum Company is contaminated with petroleum products as a result of spills/leaks. The facility is under enforcement action, and further assessment and remediation is required. The surface water affected by the ground water contamination is McCulley Creek.

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
LUGOFF-ELGIN WATER AUTH. (M)	WATEREE LAKE	1.03

Growth Potential

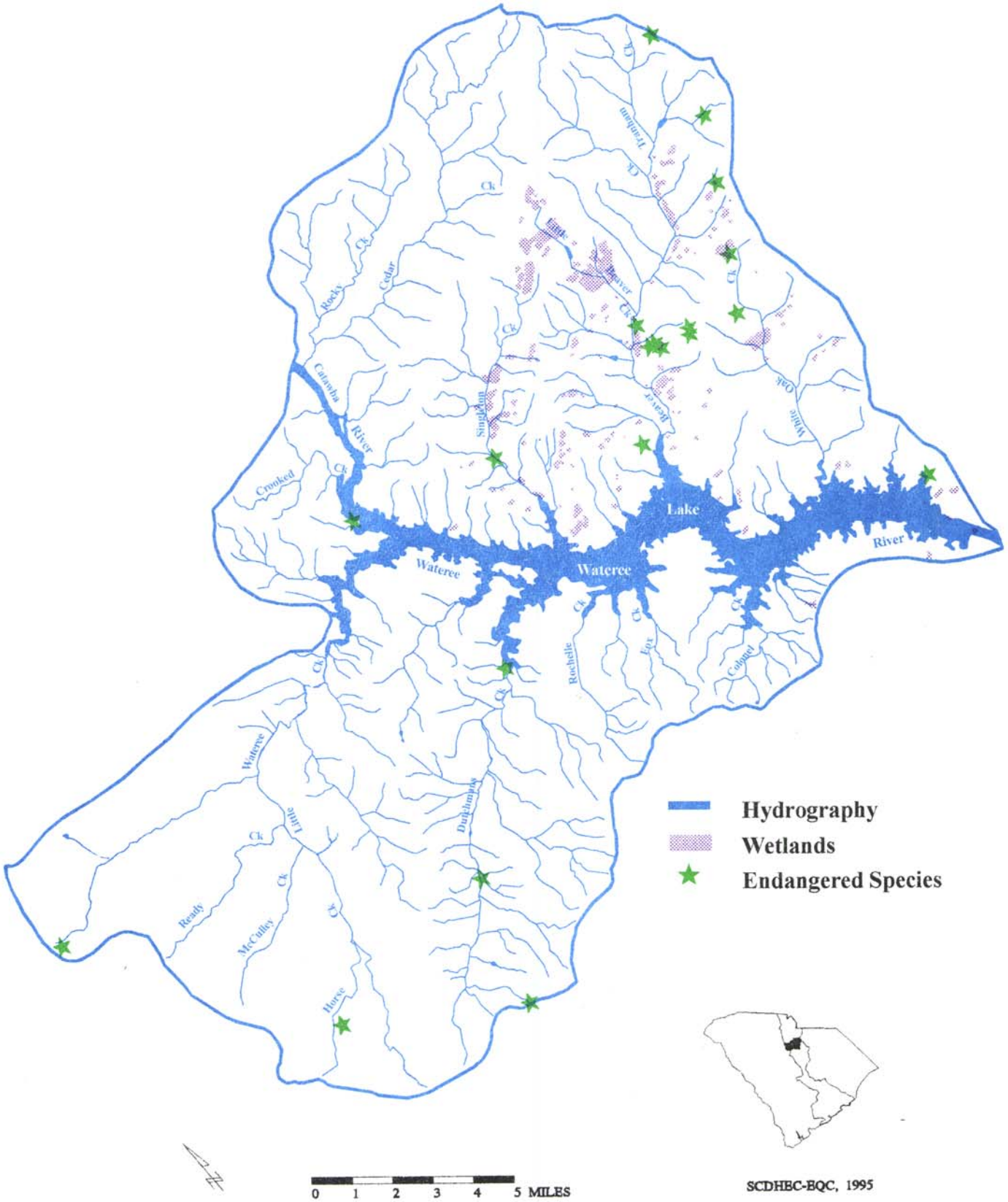
There is a moderate to high potential for continued residential and commercial development adjacent to Wateree Lake and the Town of Winnsboro. Public water is available along S.C. 34, which runs between the Towns of Winnsboro and Ridgeway, and plans are being developed to extend public sewer along this corridor.

Implementation Strategy

Aquatic life uses for Wateree Lake are impaired with elevated metal concentrations from various sources, and further investigation is recommended to eliminate the possibility of localized metal inputs. McCulley Creek is impaired from ground water contaminated with petroleum products. The facility involved is currently under enforcement action. Recreational uses for Little Wateree Creek are impaired by nonpoint source fecal coliform, and the Department will determine the source of the water quality impairment and recommend solutions to correct the problem.

Natural Resources

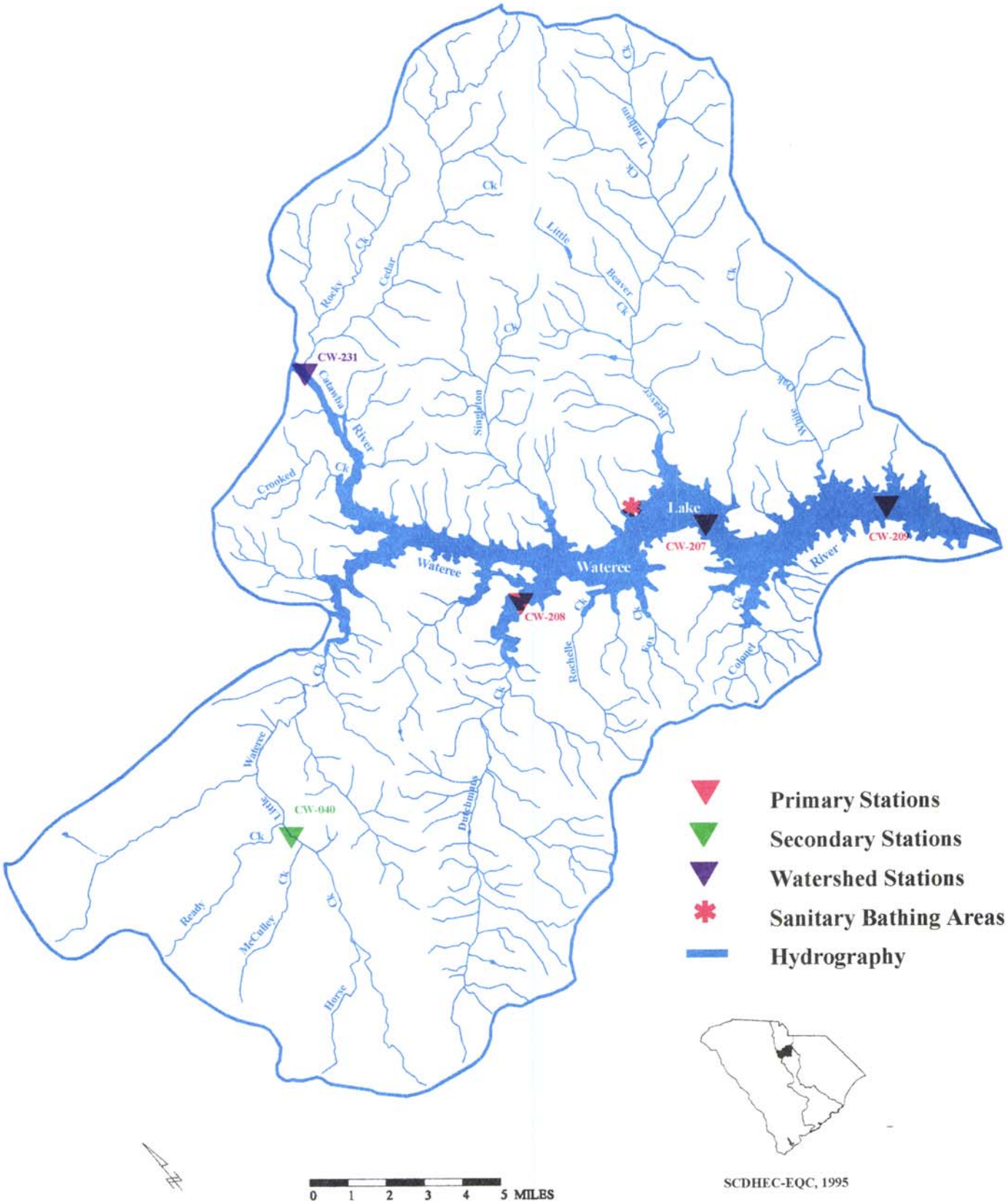
Wateree River/Wateree Lake Watershed
(03050104-010)



Water Quality Monitoring Stations

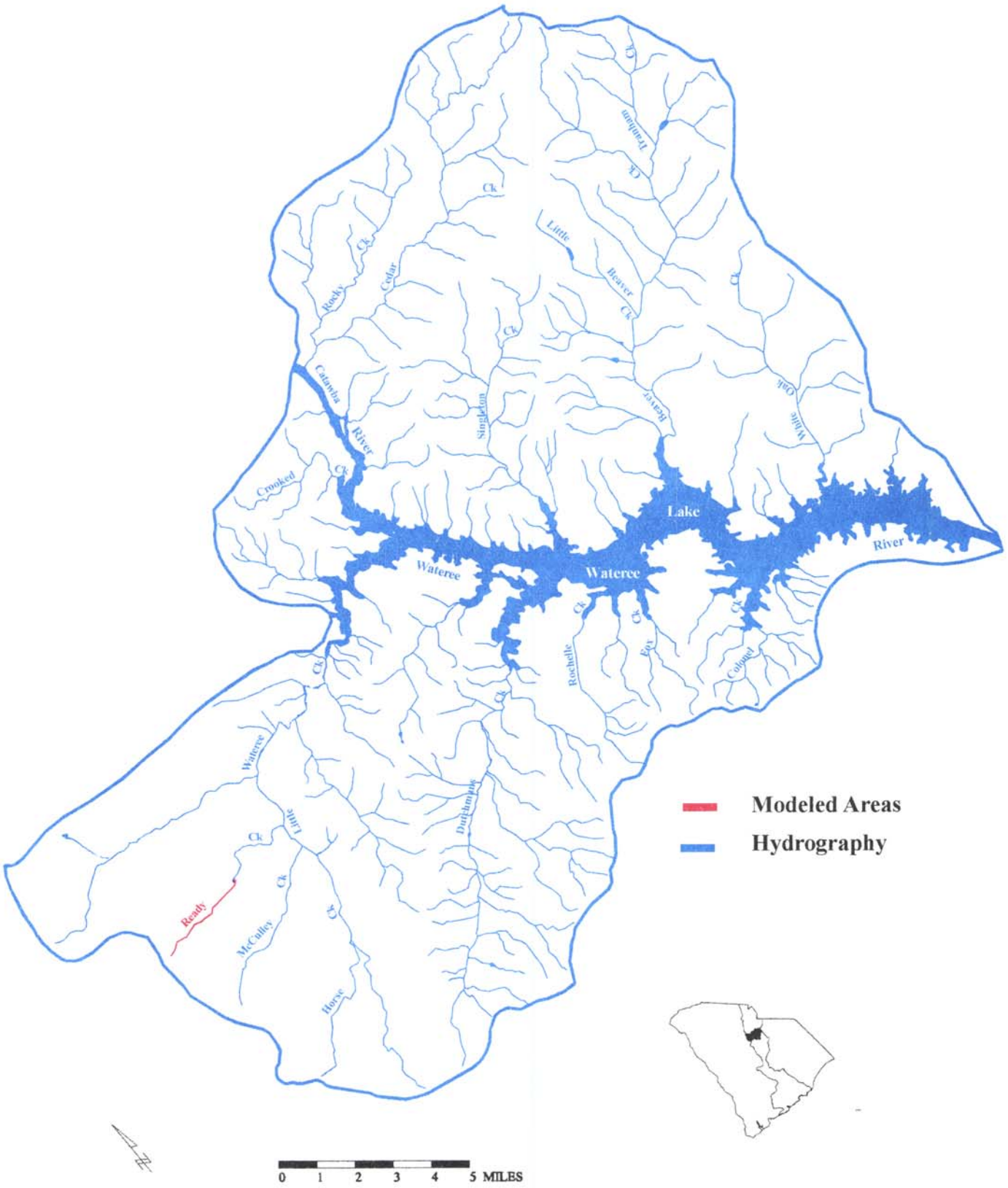
Wateree River/Wateree Lake Watershed

(03050104-010)



Streams Modeled for Wasteload Allocation

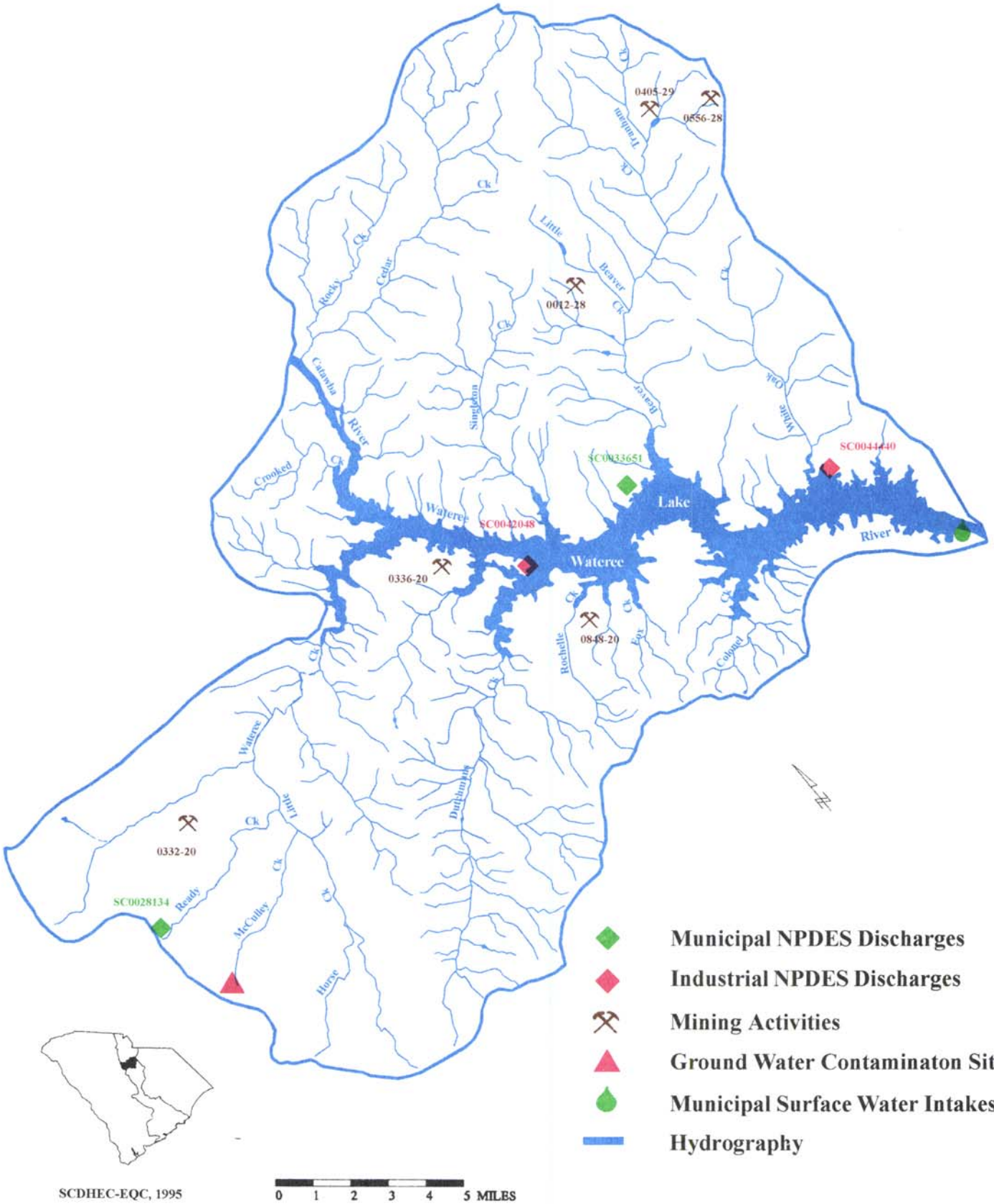
Wateree River/Wateree Lake Watershed
(03050104-010)



Activities Potentially Affecting Water Quality

Wateree River/Wateree Lake Watershed

(03050104-010)



SCDHEC-EQC, 1995

03050104-020

(Big Wateree Creek)

General Description

Watershed 03050104-020 is located in Fairfield County and consists primarily of ***Big Wateree Creek*** and its tributaries. The watershed occupies 39,340 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Winnsboro series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 15%, with a range of 2-40%. Land use/land cover in the watershed includes: 0.95% urban land, 6.04% agricultural land, 4.44% scrub/shrub land, 0.33% barren land, 87.30% forested land, and 0.94% water.

Big Wateree Creek accepts the drainage of Wall Creek, Willow Swamp Branch, Gaydens Creek, Scabber Branch, and Hogfork Branch before forming an arm of Wateree Lake. There are numerous lakes and ponds (13-22 acres) in the watershed used for recreation and flood control and a total of 64.2 stream miles, all classified FW.

Water Quality

Big Wateree Creek - Aquatic life uses are fully supported at this site, but recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***LIMITATION (EL/WQL)***
COMMENT	
BIG WATEREE CREEK	SC0035980
WHITE OAK CONFERENCE	MINOR INDUSTRIAL
PIPE #: 001 FLOW: .0375	WATER QUALITY
WQL FOR BOD_5, NH3-N, TRC, DO	

Growth Potential

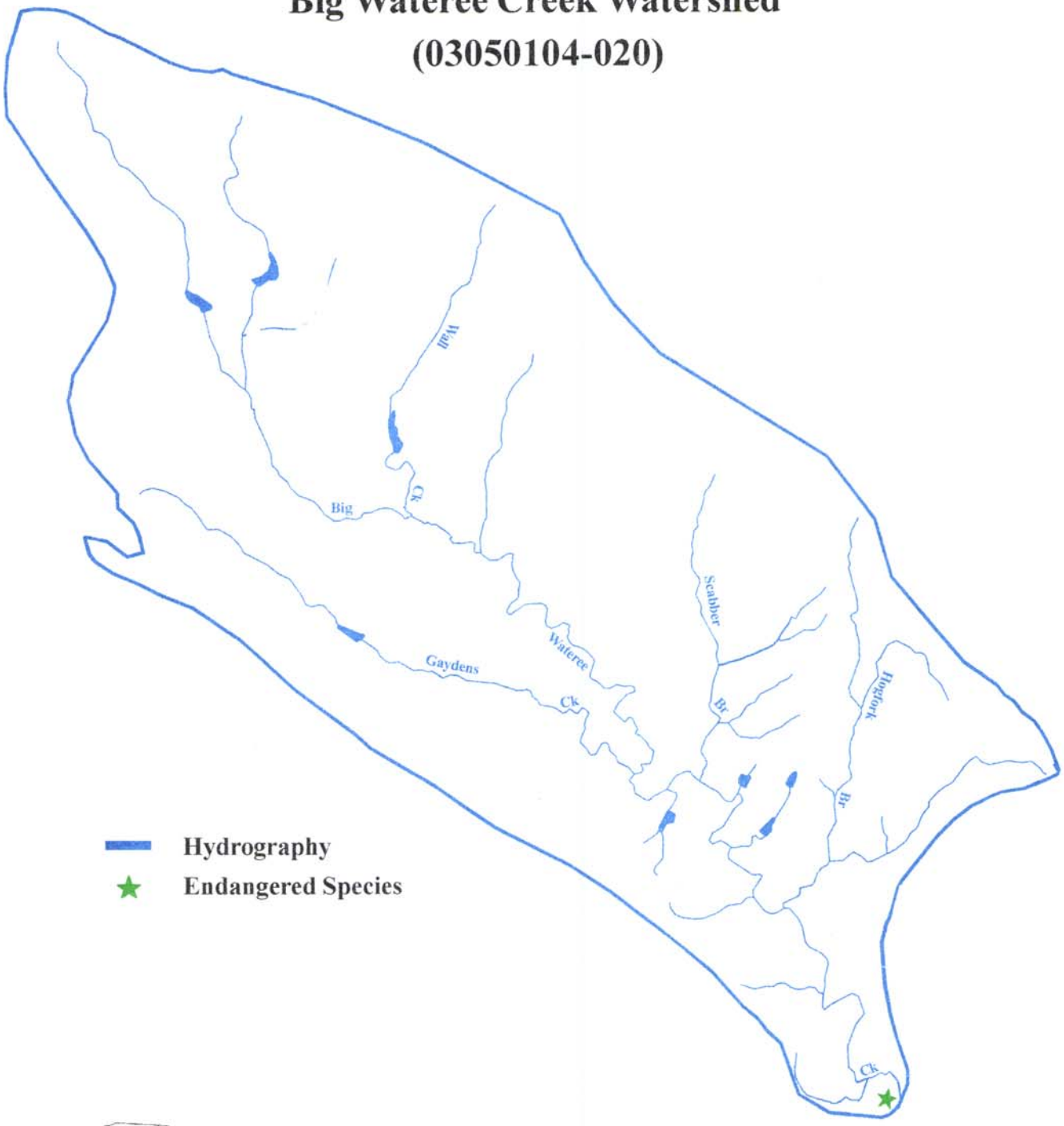
There is a low potential for growth in this rural watershed. I-77 and S.C. 200 cross near the center of the watershed and some commercial/industrial growth may occur around the intersection. The only water and sewer service is available along S.C. 200 from the Town of Winnsboro to I-77. Another area of minor growth is the Blackstock area north of Winnsboro on U.S. 321.

Implementation Strategy

Recreational uses on Big Wateree Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

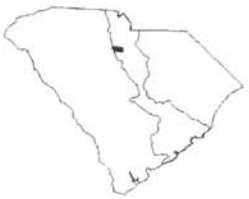
Natural Resources

Big Wateree Creek Watershed
(03050104-020)



Hydrography

Endangered Species

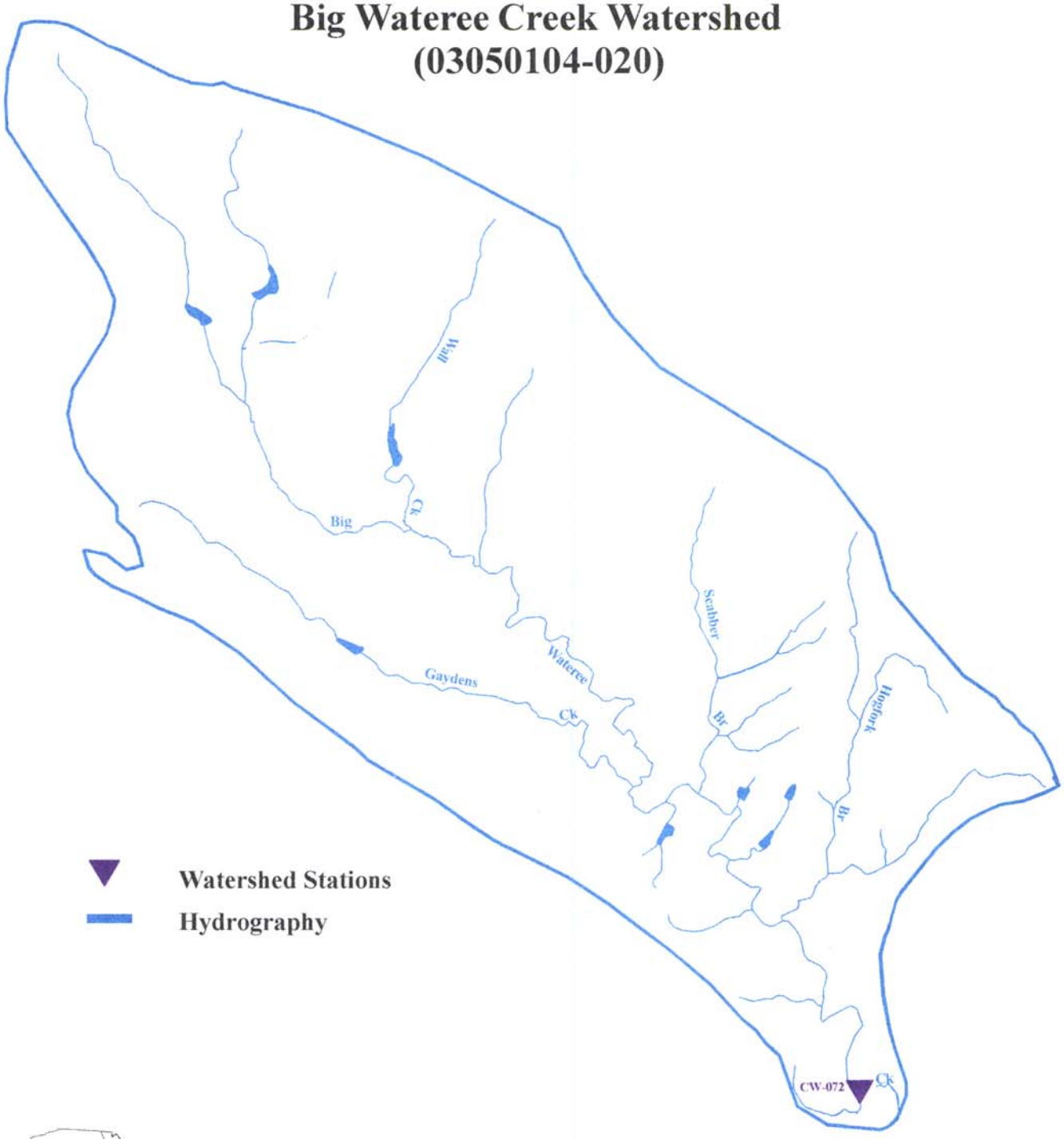


SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Water Quality Monitoring Stations

Big Wateree Creek Watershed
(03050104-020)

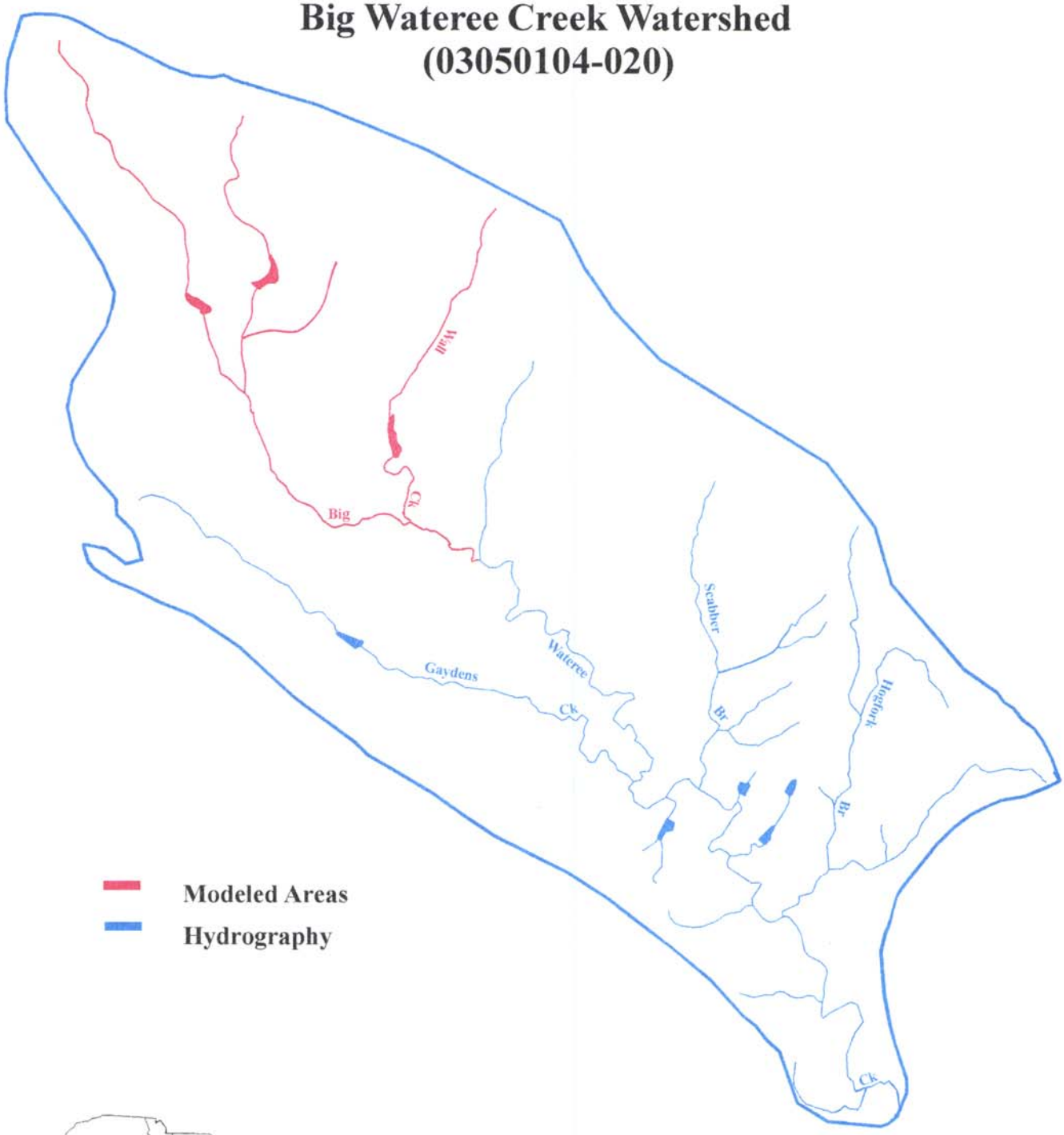


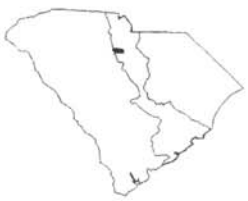
SCDHEC-BQC, 1995

0 1 2 3 4 5 MILES

Streams Modeled for Wasteload Allocation

Big Wateree Creek Watershed
(03050104-020)



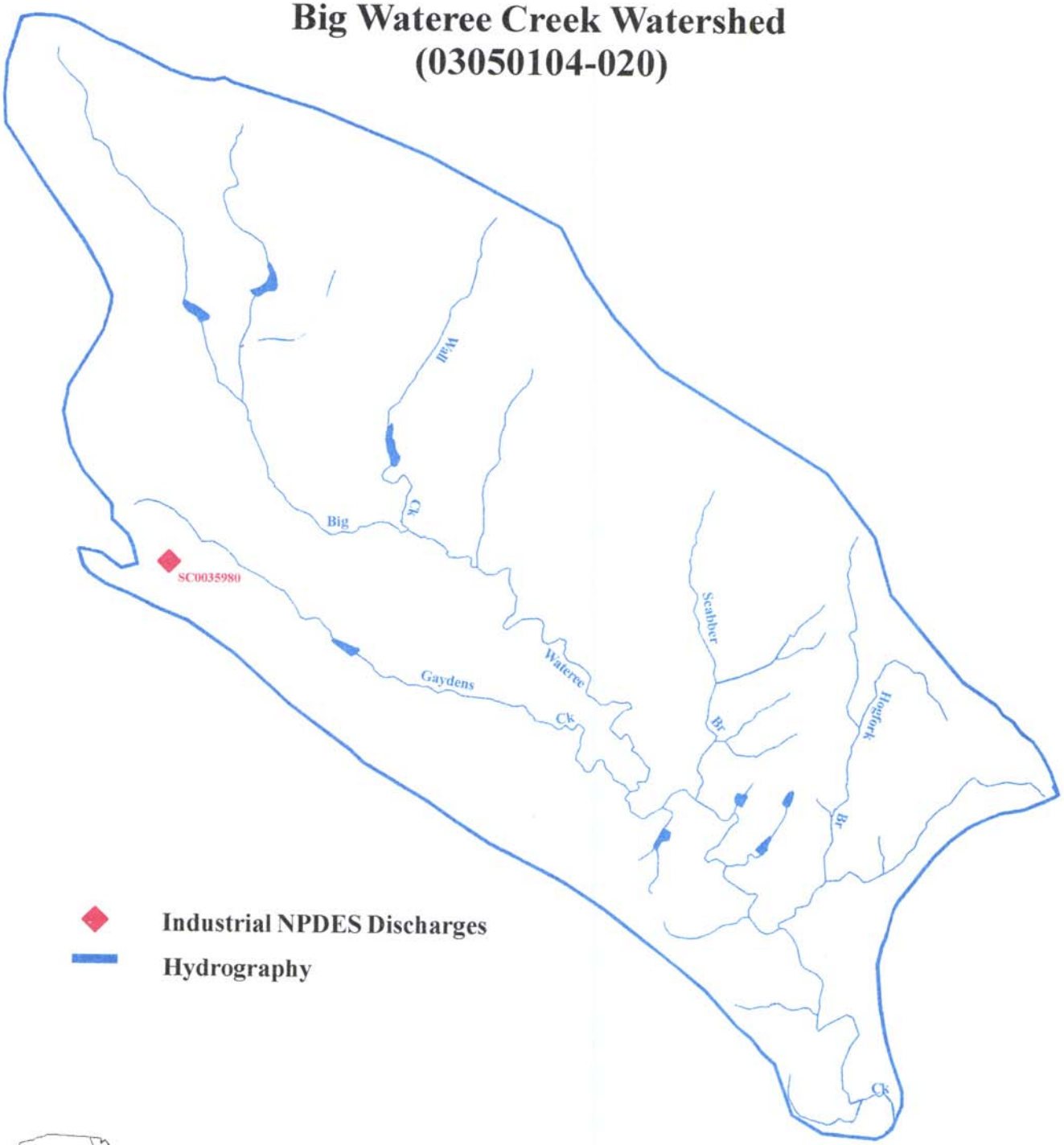


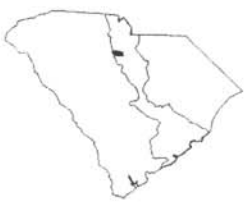
SCDHEC-BQC, 1995

0 1 2 3 4 5 MILES

Activities Potentially Affecting Water Quality

Big Wateree Creek Watershed
(03050104-020)





SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

03050104-030

(Wateree River)

General Description

Watershed 03050104-030 is located in Kershaw, Sumter and Richland Counties and consists primarily of the ***Wateree River*** and its tributaries from the Wateree dam to its confluence with the Congaree River. The watershed occupies 229,343 acres of the Sandhills and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Lakeland-Chastain-Tawcaw-Vaucluse series. The erodibility of the soil (K) averages 0.22; the slope of the terrain averages 5%, with a range of 0-25%. Land use/land cover in the watershed includes: 4.42% urban land, 14.61% agricultural land, 10.02% scrub/shrub land, 0.04% barren land, 47.42% forested land, 20.02% forested wetland, 0.42% nonforested wetland, and 3.05% water.

Downstream from the Wateree Dam, the Wateree River accepts drainage from Grannies Quarter Creek watershed (03050104-040), Sawneys Creek watershed (03050104-050), Rocky Branch, and Sanders Creek (Gum Swamp Creek). There are several ponds and lakes along the Sanders Creek drainage that include Vaughs Mill Pond (20 acres), Colonial Lake (120 acres), and Lake Shamokin (18 acres). Camp Creek enters the river downstream near the City of Camden, as does the Twentyfive Mile Creek watershed (03050104-060), Gillies Creek (Buck Creek), Big Pine Tree Creek watershed (03050104-070), Town Creek, and Gillies Ditch (Jumping Gully). Further downstream, the Swift Creek watershed (03050104-080) enters the river followed by Rafting Creek (Ellerbee Mill Pond, Bracey Mill Creek, Little Rafting Creek, Dinkins Mill Pond), the Spears Creek watershed (03050104-090), Gum Swamp Branch (Robert Branch), and the Colonels Creek watershed (03050104-100). Gum Swamp Branch flows through several oxbow lakes that include Ruggs Lake, Big Lake, Little Lake, and Dry Swamp Lake. The Wateree River flows past the Town of Eastover and just prior to its confluence with the Congaree River, Little River (Beech Creek, Halfway Creek, Campbell Creek, Shanks Creek, Sandy Creek, Fullers Earth Creek) drains into the Wateree River. Kohlers Old River connects Halfway Creek to the river. There are numerous ponds and lakes in this watershed (10-120 acres) that are used for municipal, recreational, irrigational, industrial, and water supply purposes. Additional natural resources include the Manchester State Forest and Poinsett State Park located in the lower portion of the watershed. Poinsett State Park Lake (10 acres) is located on Shanks Creek. There are a total of 680.8 stream miles in this watershed, all classified FW.

Water Quality

Wateree River - There are four SCDHEC monitoring sites along the Wateree River. This river was Class B until April, 1992. Recreational uses are fully supported at all four sites. Aquatic life uses are not supported at the upstream site due to dissolved oxygen excursions. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly decreasing trends in five-day biochemical oxygen demand and

total phosphorus suggest improving conditions. Toxaphene, a pesticide, was detected in the 1990 sediment sample.

Further downstream, at station CW-214, aquatic life uses are again not supported due to dissolved oxygen excursions. This site is currently inactive, and was replaced by CW-019. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. A significantly increasing trend in pH was also detected. Aquatic life uses are fully supported at station CW-206, but may be threatened by a significantly increasing trend in turbidity. Significantly decreasing trends in total suspended solids, total phosphorus, and total nitrogen concentrations suggest improving conditions.

Just upstream of the confluence with the Congaree River, aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. High concentrations of zinc were measured in water in 1989 and 1993. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. This site is also sampled by the SC Public Service Authority (SCPSA).

Poinsett State Park Lake - The lake has been treated every year since 1991 with aquatic herbicides to provide improved public access for swimming and boating.

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
SHANK CREEK POINSETT PARK LAKE	43-N01 ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

Beech Creek is included on the §304(l) long list of impacted waterbodies due to concerns for non-§307(a) toxicity.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
WATEREE RIVER SCE&G/WATEREE STATION PIPE #: 001 FLOW: 490 PIPE #: 002,003A,003B FLOW: M/R	SC0002038 MAJOR INDUSTRIAL EFFLUENT
WATEREE RIVER EI DUPONT/MAY PLANT PIPE #: 001 FLOW: 4.200 PIPE #: 002 FLOW: 0.012	SC0002585 MAJOR INDUSTRIAL EFFLUENT

WATEREE RIVER NIPA HARDWICK CHEMICAL PIPE #: 002 FLOW: 0.800 PIPE #: 003 FLOW: M/R WQL FOR TOXICS	SC0002682 MAJOR INDUSTRIAL WATER QUALITY
WATEREE RIVER CITY OF CAMDEN WWTP PIPE #: 001 FLOW: 2.4	SC0021032 MAJOR MUNICIPAL EFFLUENT
WATEREE RIVER CITY OF CAMDEN WWTP PIPE #: 001 FLOW: 3.0 PROPOSED	SC0021032 MAJOR MUNICIPAL EFFLUENT
WATEREE RIVER UNION CAMP CORP. PIPE #: 001,01A FLOW: M/R	SC0038121 MAJOR INDUSTRIAL EFFLUENT
WATEREE RIVER TOWN OF KERSHAW/LUGOFF PLT PIPE #: 001 FLOW: 0.700	SC0039870 MINOR MUNICIPAL EFFLUENT
WATEREE RIVER WILDWOOD UTIL. REG. WWTP PIPE #: 001 FLOW: 6.000 PROPOSED	SC0043451 MINOR COMMUNITY EFFLUENT
WATEREE RIVER OAK MITSUI INC. PIPE #: 001 FLOW: 0.183 TO BE TIED IN	SC0044750 MINOR INDUSTRIAL EFFLUENT
WATEREE RIVER SC DEPT CORR./WATEREE PIPE #: 001 FLOW: 0.250	SC0045349 MINOR COMMUNITY EFFLUENT
GILLIES DITCH WATEREE TEXTILES CORPORATION PIPE #: 001 FLOW: 0.45 SUMMER LIMITS WQL FOR BOD_5, TRC, DO WINTER LIMITS WQL FOR BOD_5, NH3-N, TRC, DO	SC0023264 MINOR INDUSTRIAL WATER QUALITY
GILLIES CREEK WHIBCO, INC./BLANEY PLT PIPE #: 001,01A,002,02A,003 FLOW: M/R WASHWATER	SC0002909 MINOR INDUSTRIAL EFFLUENT
GILLIES CREEK COGSDILL TOOL PRODUCTS PIPE #: 001 FLOW: M/R WQL FOR DO	SC0037575 MINOR INDUSTRIAL WATER QUALITY
GUM SWAMP BRANCH BECKER MINERALS/HASSKAMP PLT PIPE #: 001,002 FLOW: M/R	SC0039292 MINOR INDUSTRIAL

LITTLE RAFTING CREEK SCENIC LAKE PARK PIPE #: 001 FLOW: 0.010 WQL FOR BOD_5, NH3-N, TRC, DO	SC0031895 MINOR COMMUNITY WATER QUALITY
BEECH CREEK US AIR FORCE/SHAW AFB PIPE #: 001 FLOW: 1.20 PIPE #: 01A,01B,002,003,004,005,006,007 FLOW: M/R WETLAND; WQL FOR BOD_5, NH3-N, TRC, DO	SC0024970 MAJOR INDUSTRIAL WATER QUALITY
BEECH CREEK TRIB CWS/OAKLAND PLANTATION SD PIPE #: 001 FLOW: 0.160 WETLAND; WQL FOR BOD_5, NH3-N, TRC, DO	SC0030678 MINOR COMMUNITY WATER QUALITY
BEECH CREEK TRIB SPANISH GARDEN APTS PIPE #: 001 FLOW: 0.0182 WETLAND; WQL FOR BOD_5, NH3-N, TRC, DO	SC0033235 MINOR COMMUNITY WATER QUALITY

LAND APPLICATION *FACILITY NAME*	*PERMIT #* *TYPE*
SPRAYFIELD HERMITAGE FARMS MHP	ND0069868 MINOR COMMUNITY
SPRAYFIELD SMITHS MHP	ND0061735 MINOR COMMUNITY
RAPID INFILTRATION BASIN PRAXAIR, INC.	ND0069655 INDUSTRIAL

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
EI DUPONT INDUSTRIAL	IWP-075 ACTIVE
UNION CAMP CORP. INDUSTRIAL	IWP-187 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
LUGOFF SAND COMPANY LUGOFF SAND MINE	0121-28 SAND
JW CONDER EASTERN LAND & TIMBER INDUSTRIAL PARK MINE	0592-28 SAND
WHIBCO, INC. BLANEY PLANT	0089-28 SAND

RICHTEX CORP. WATEREE CLAY PIT	0410-43 CLAY
BECKER MINERALS, INC. HARRY HASSKAMP MINE	0582-43 SAND/GRAVEL
BECKER MINERALS, INC. HORATIO MINE	0904-43 SAND/GRAVEL

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
EI DUPONT DENEMOURS (M)	WATEREE RIVER	2.68
EI DUPONT DENEMOURS (I)	WATEREE RIVER	9.07
UNION CAMP CORP. (I)	WATEREE RIVER	40.03
WHITEHEAD BROS. BLANEY PLT (I)	GILLIES CREEK	7.20

Growth Potential

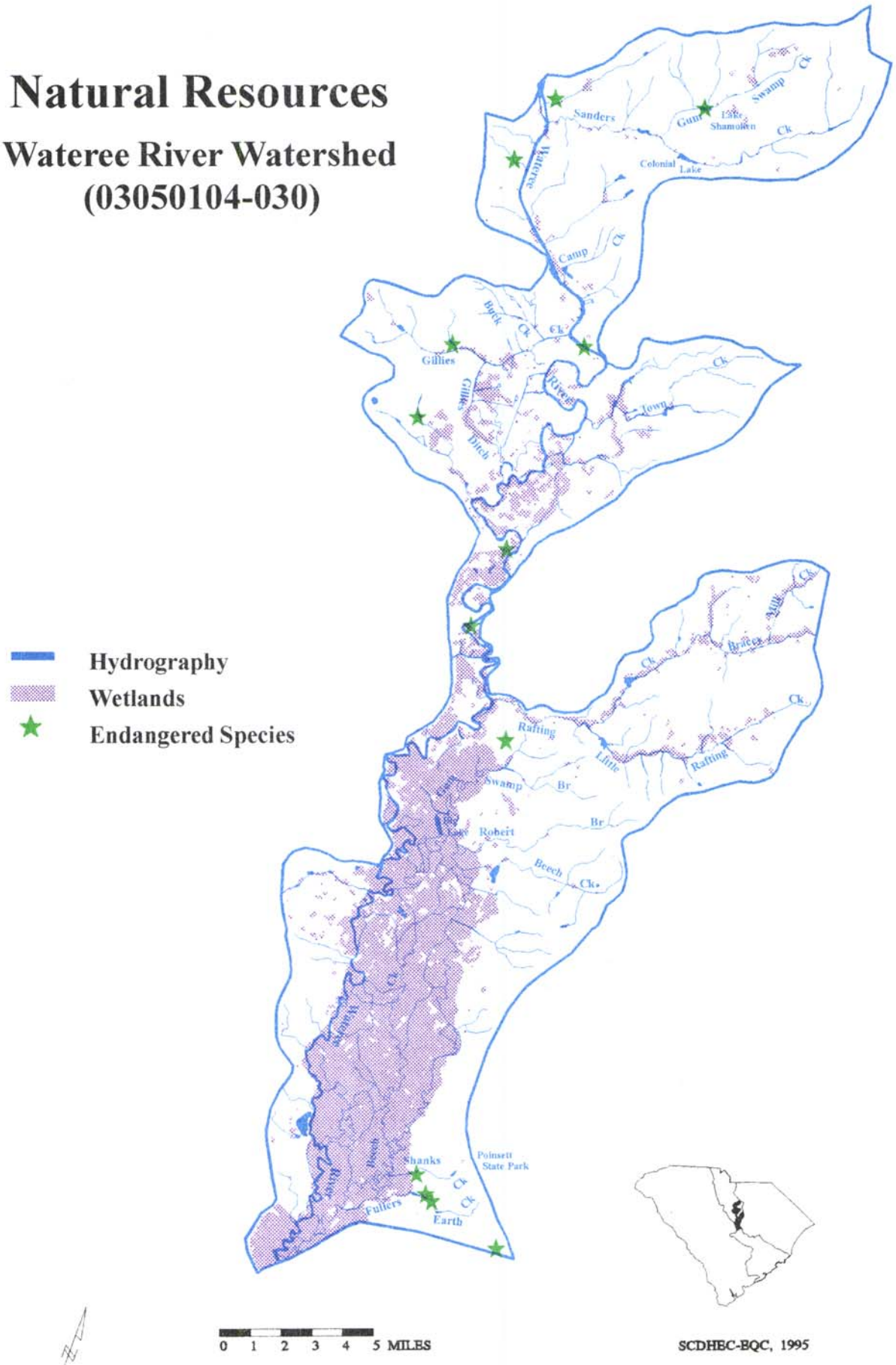
This watershed contains the City of Camden and the Town of Lugoff, and is adjacent to Shaw Air Force Base. There is a high potential for development around these areas. A large portion of the watershed are river bottom-lands swamp forests and are heavily forested for timber. The City of Camden is proposing to upgrade the WWTF to 3.0 MGD to serve the growth in the area.

Implementation Strategy

Aquatic life uses are impaired on the Wateree River from low dissolved oxygen concentrations due to the Wateree Lake Dam. The impoundment restricts the water flow entering the reiver and the water downstream becomes stagnated. A study to evaluate the wasteload allocations for dischargers on the Wateree River is underway.

Natural Resources

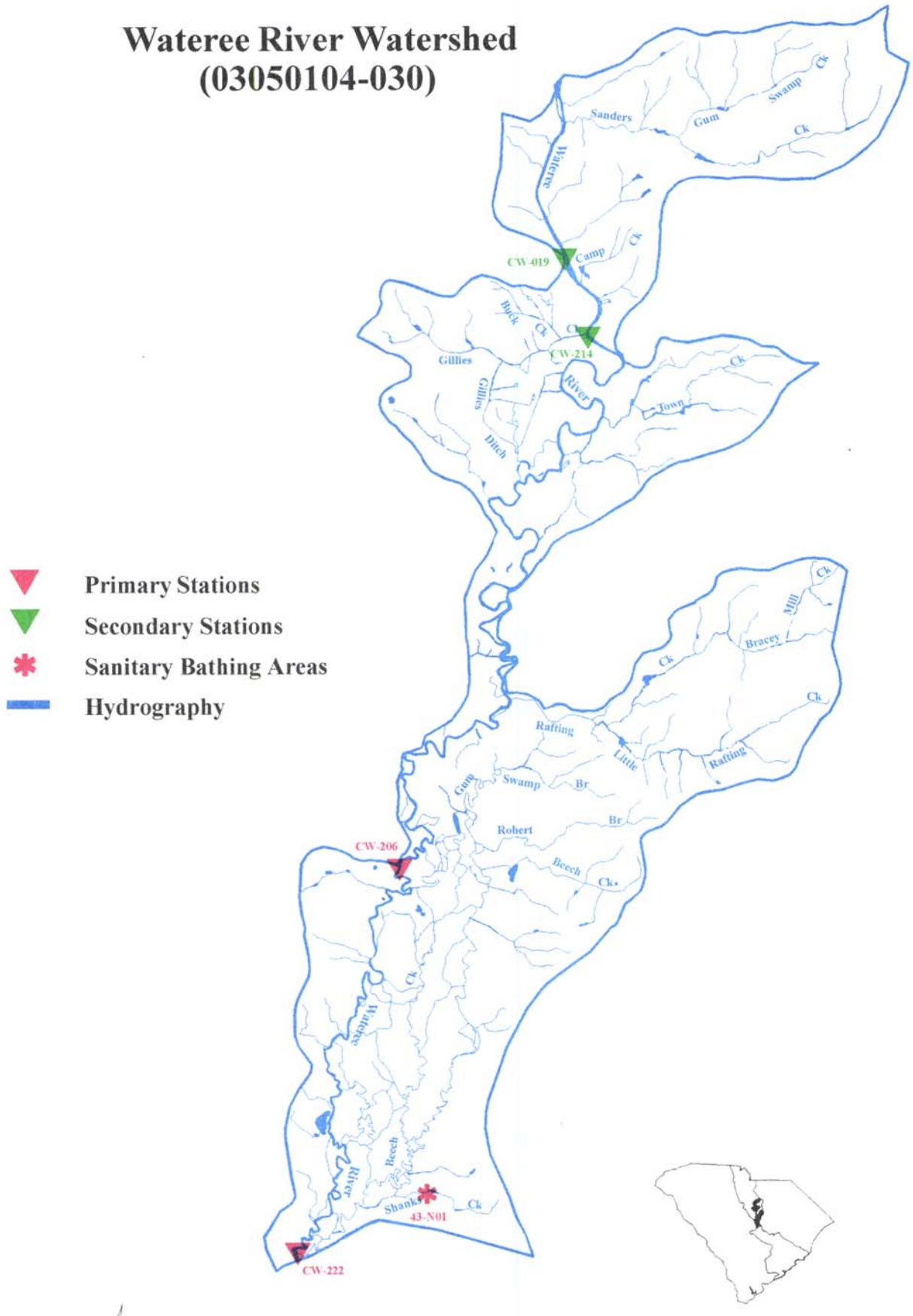
Wateree River Watershed (03050104-030)



SCDHEC-BQC, 1995

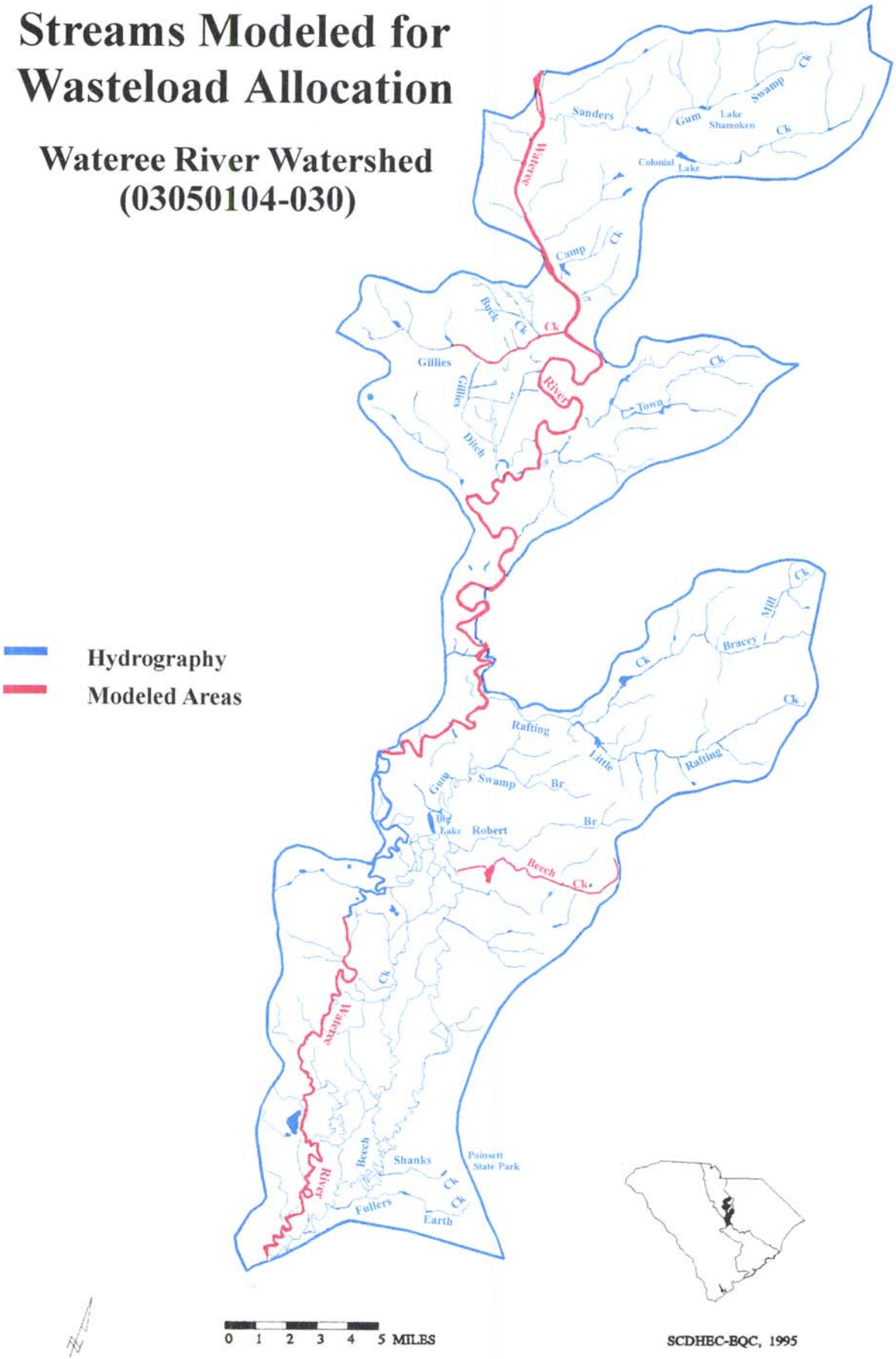
Water Quality Monitoring Stations

Wateree River Watershed (03050104-030)



Streams Modeled for Wasteload Allocation

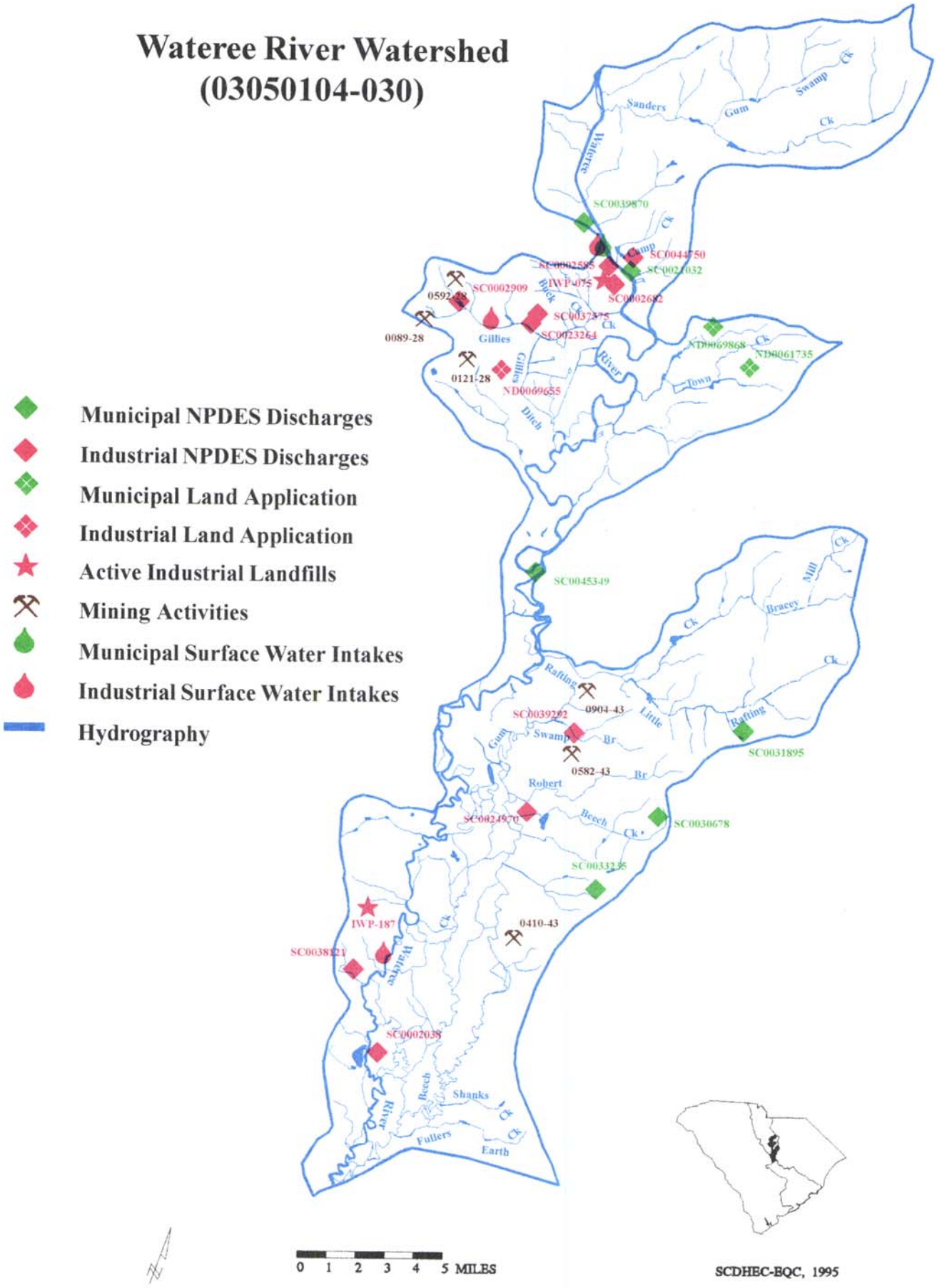
Wateree River Watershed (03050104-030)



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Wateree River Watershed (03050104-030)



03050104-040

(Grannies Quarter Creek)

General Description

Watershed 03050104-040 is located in Kershaw and Lancaster Counties and consists primarily of ***Grannies Quarter Creek*** and its tributaries. The watershed occupies 44,419 acres of the Sandhills region of South Carolina. The predominant soil types consist of an association of the Goldston-Lakeland-Badin series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 15%, with a range of 0-45%. Land use/land cover in the watershed includes: 0.01% urban land, 8.10% agricultural land, 4.04% scrub/shrub land, 87.12% forested land, 0.66% forested wetland, and 0.06% water.

Grannies Quarter Creek drains into the Wateree River just below the Wateree Lake Dam. Flat Rock Creek (Little Flat Rock Creek) and Dry Branch flow into Grannies Quarter Creek. There are several ponds and lakes and a total of 80.8 stream miles in this watershed, all classified FW.

Water Quality

Grannies Quarter Creek - There are two SCDHEC monitoring sites along Grannies Quarter Creek. Aquatic life uses are fully supported at the upstream site based on macroinvertebrate community data. At the downstream site, aquatic life and recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Mining Activities

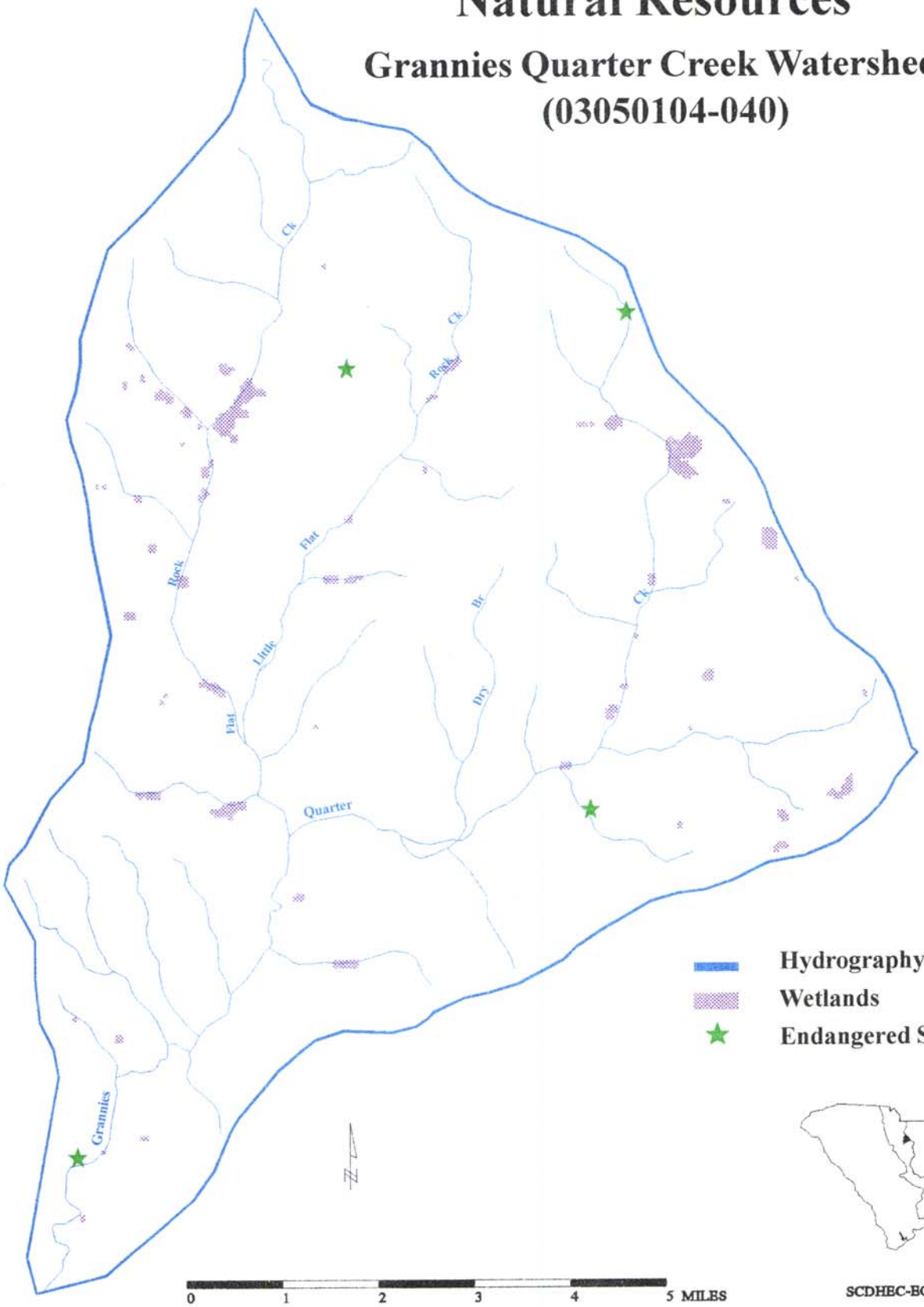
MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
DESTAG OF MISSOURI CAROLINA MAHOGANY #1	0013-28 GRANITE
GRANITE PANELWALL COMPANY CAROLINA MAHOGANY #2	0014-28 GRANITE
CAROLINA QUARRIES KERSHAW QUARRY	0404-28 GRANITE
N.C. GRANITE CORP. PALMETTO QUARRIES #1	0487-28 GRANITE

Growth Potential

There is a low potential for growth in this watershed. U.S. Highways 521 and 601 run through the area and limited growth is expected adjacent to these roads.

Natural Resources

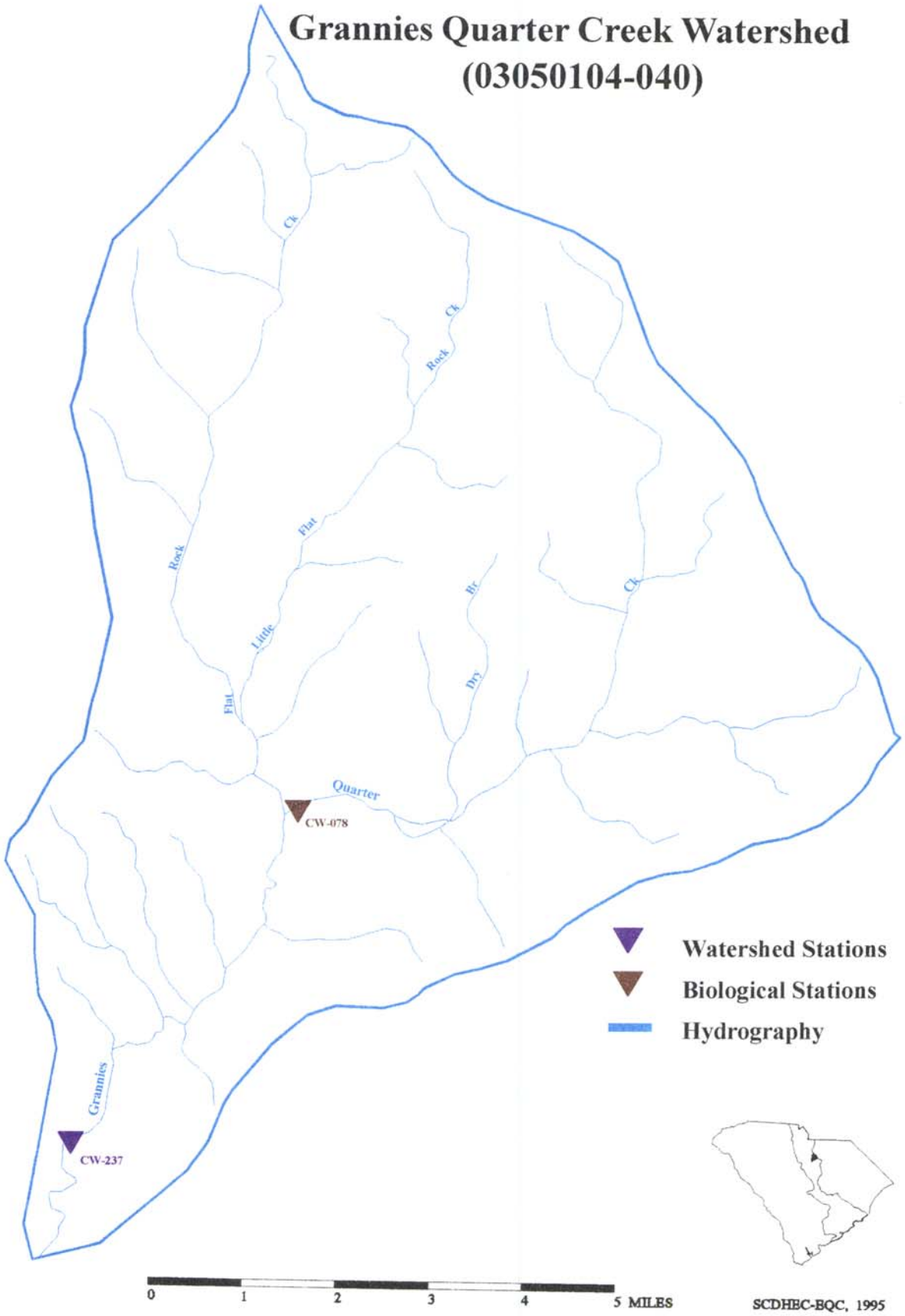
Grannies Quarter Creek Watershed (03050104-040)



SCDHEC-EQC, 1995

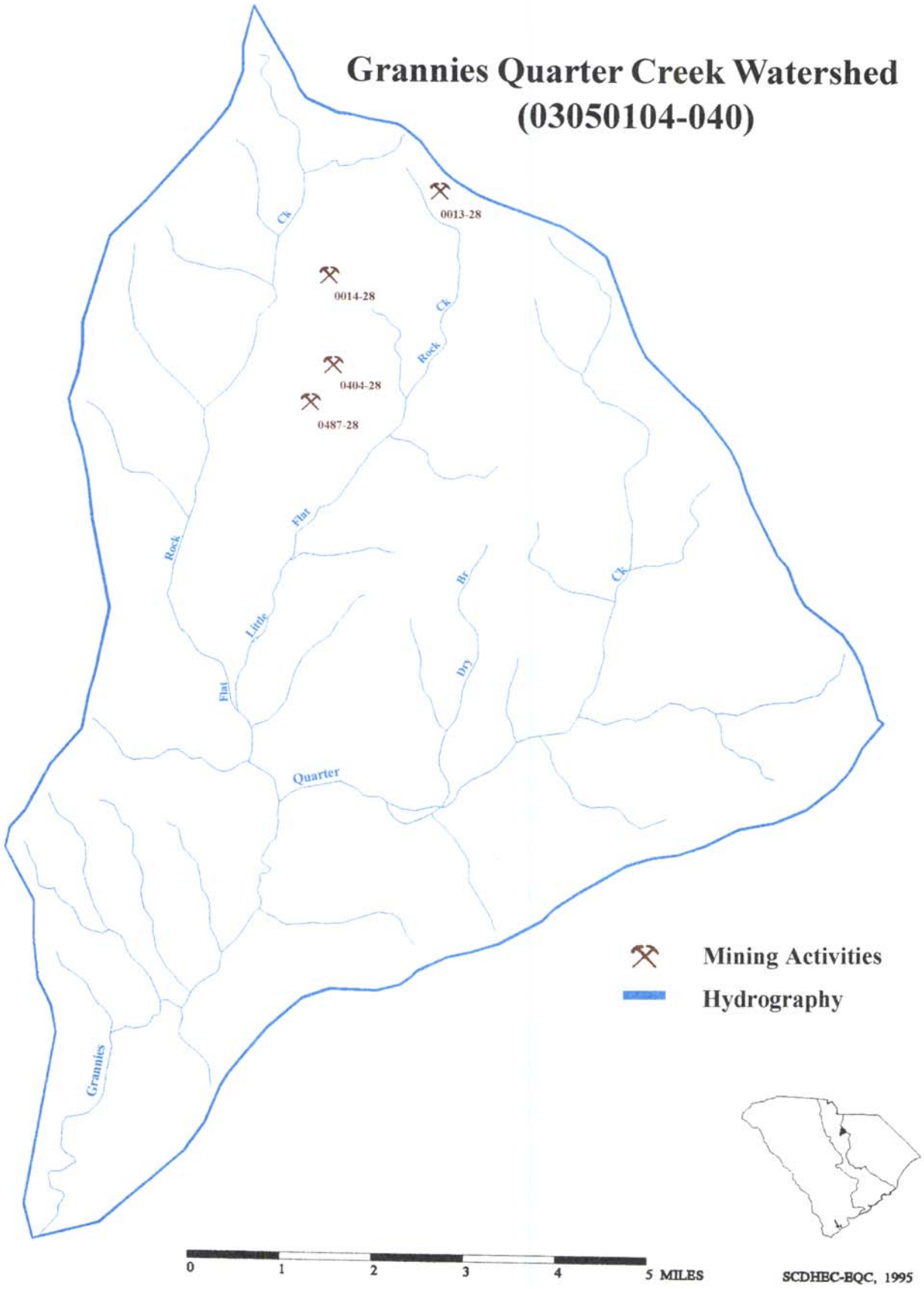
Water Quality Monitoring Stations

Grannies Quarter Creek Watershed (03050104-040)



SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality



03050104-050

(Sawneys Creek)

General Description

Watershed 03050104-050 is located in Fairfield and Kershaw Counties and consists primarily of ***Sawneys Creek*** and its tributaries. The watershed occupies 39,384 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Appling-Hiwassee series. The erodibility of the soil (K) averages 0.43; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 0.54% urban land, 8.91% agricultural land, 4.78% scrub/shrub land, 0.02% barren land, 85.27% forested land, 0.33% forested wetland, and 0.16% water.

Sawneys Creek originates near the Town of Ridgeway and drains into the Wateree River. Thorntree Creek and Bee Branch drain into Sawneys Creek. There are a total of 107.8 stream miles in this watershed, all classified FW.

Water Quality

Sawneys Creek - There are two SCDHEC monitoring sites along Sawneys Creek, which was Class B until April, 1992. Recreational uses are not supported at either site due to fecal coliform bacteria excursions under Class FW standards. At the upstream location, aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened due an elevated concentration of cadmium and a very high concentration of zinc measured in 1991. A significantly decreasing trend in pH was also noted. A significantly decreasing trend in fecal coliform bacteria concentration at the upstream site suggests improving conditions. Aquatic life uses are fully supported at the downstream site.

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
THORNTREE CREEK TRIB CAMP LONGRIDGE	20-01N ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
SAWNEYS CREEK KENNECOTT RIDGEWAY MINING CO. PIPE #: 001,002 FLOW: M/R TO BE ELIMINATED	SC0041378 MINOR INDUSTRIAL EFFLUENT

LAND APPLICATION SYSTEM FACILITY NAME	*ND# TYPE*
SPRAYFIELD FAIRFIELD NURSING HOME	ND0067008 MINOR COMMUNITY

Nonpoint Source Contributions

Sawneys Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform concerns.

Mining Activities

MINING COMPANY MINE NAME	*PERMIT # MINERAL*
KENNECOTT RIDGEWAY MINING CO. RIDGEWAY MINE	0724-20 GOLD ORE

Growth Potential

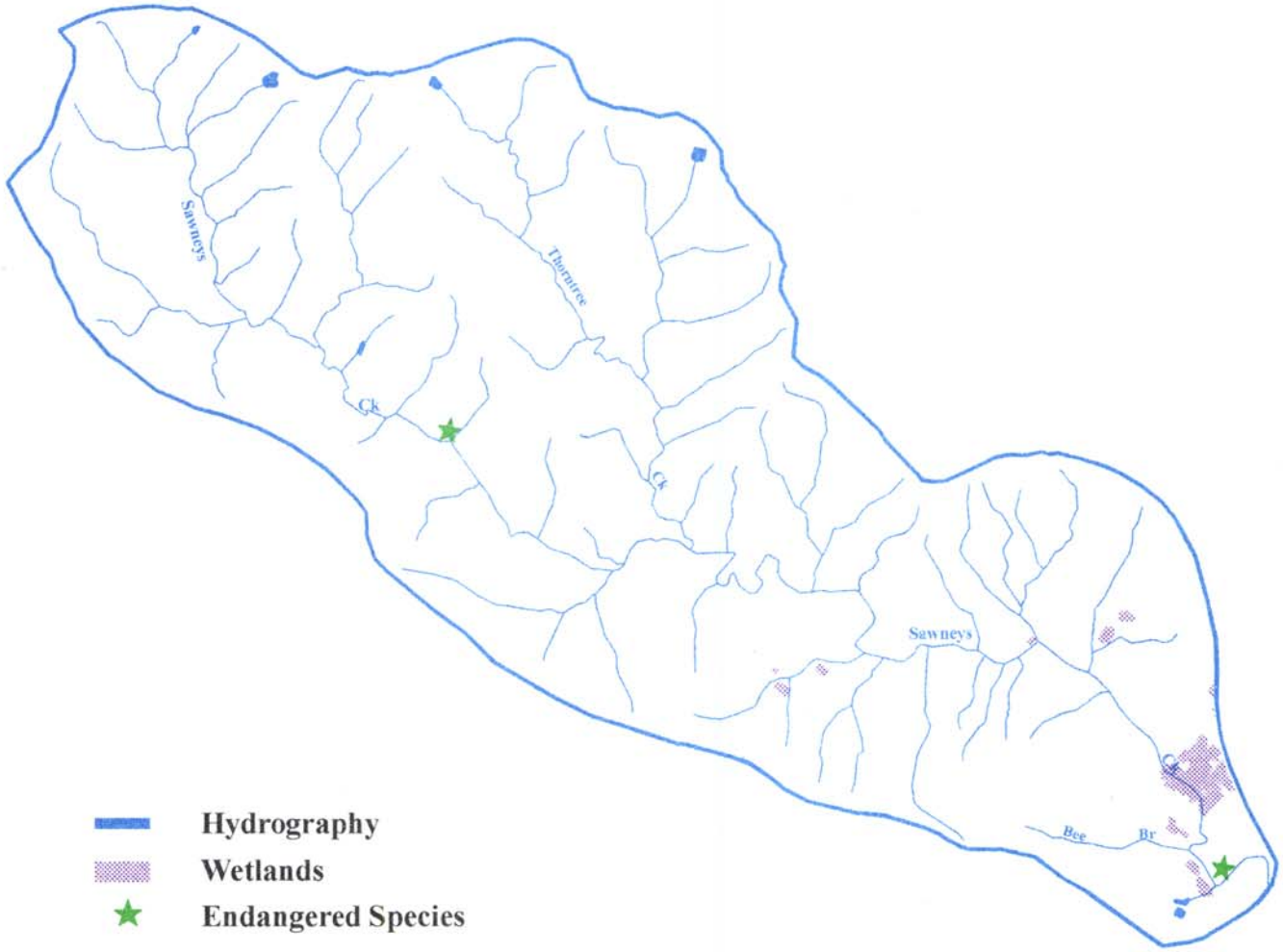
There is a low potential for growth in this watershed, which contains a portion of the Town of Ridgeway. The only available water service extends along S.C. 34 east of Ridgeway to the Ridgeway gold mine.

Implementation Strategy

Recreational uses for Sawneys Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

Natural Resources

Sawneys Creek Watershed
(03050104-050)



Hydrography

Wetlands

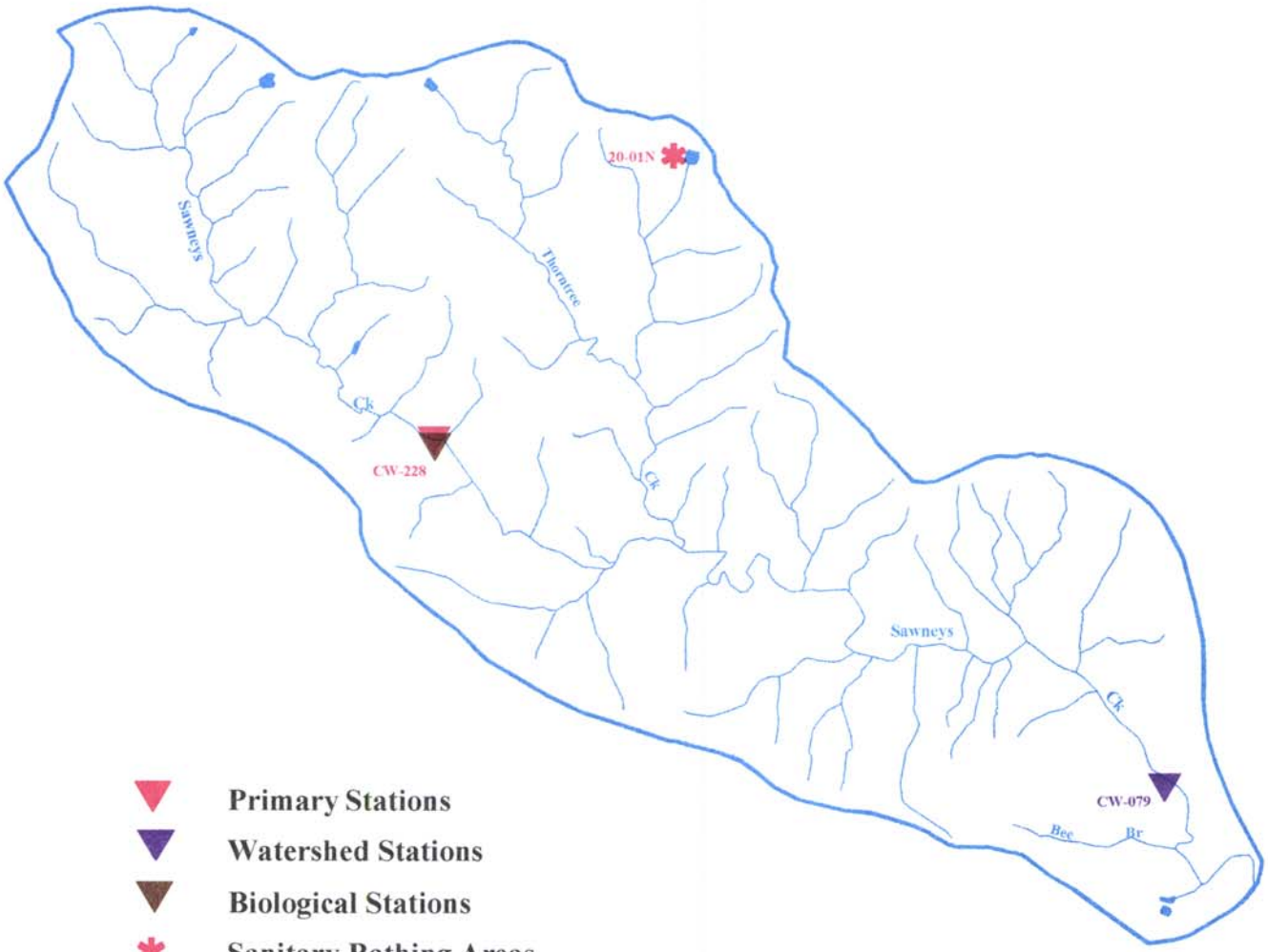
Endangered Species

0 1 2 3 4 5 MILES

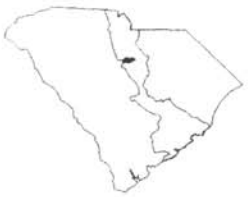
SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Sawneys Creek Watershed
(03050104-050)



- Primary Stations
- Watershed Stations
- Biological Stations
- Sanitary Bathing Areas
- Hydrography

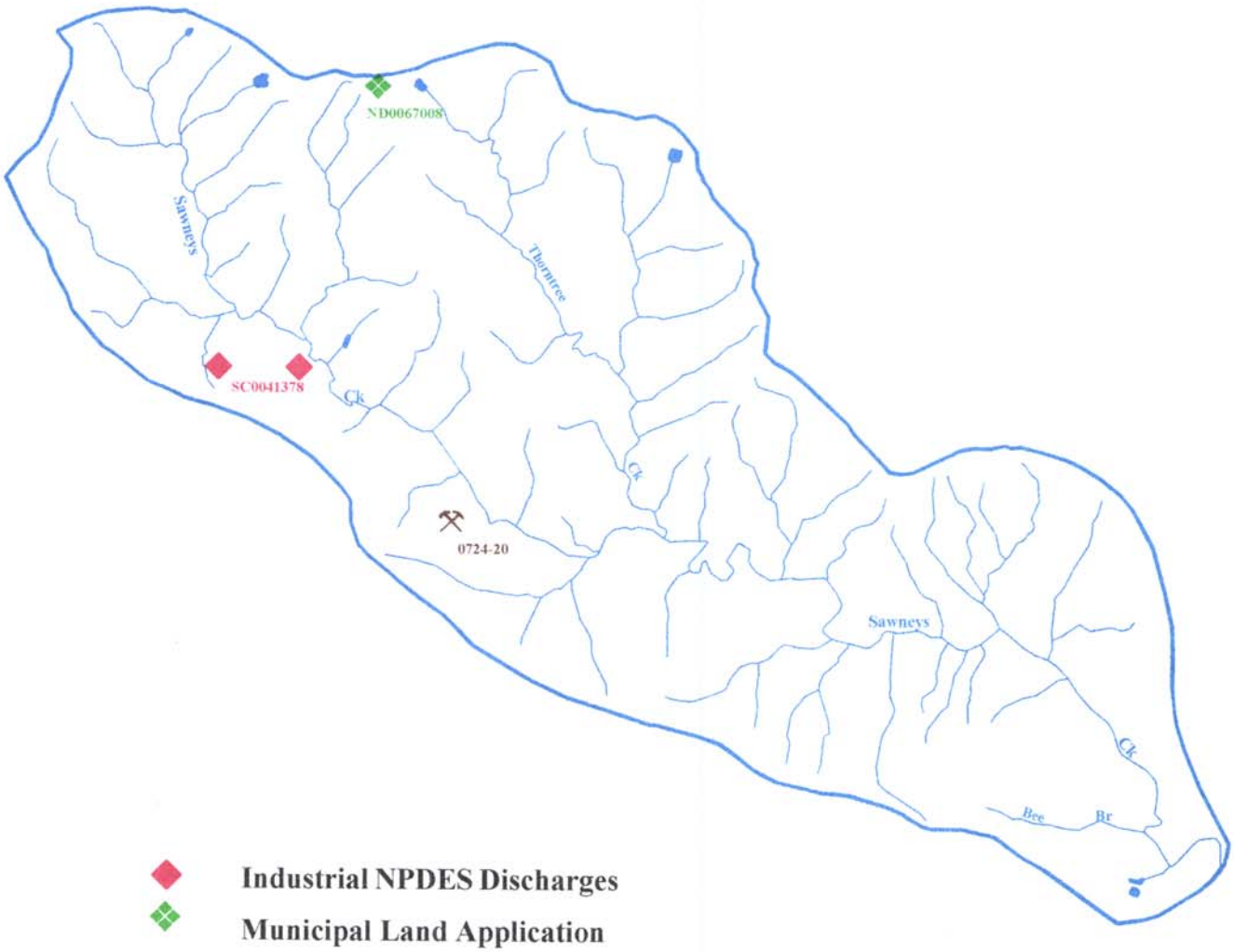


0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Sawneys Creek Watershed
(03050104-050)



Industrial NPDES Discharges

Municipal Land Application

Mining Activities

Hydrography

0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

03050104-060

(Twentyfive Mile Creek)

General Description

Watershed 03050104-060 is located in Richland, Kershaw, and Fairfield Counties and consists primarily of ***Twentyfive Mile Creek*** and its tributaries. The watershed occupies 78,925 acres of the Sandhills and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Lakeland-Wagram-Goldston-Alpin-Tatum series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 10%, with a range of 0-45%. Land use/land cover in the watershed includes: 6.29% urban land, 11.11% agricultural land, 6.41% scrub/shrub land, 0.09% barren land, 74.84% forested land, 0.32% forested wetland, and 0.95% water.

Twentyfive Mile Creek originates near the Town of Blythewood and accepts drainage from Simmons Creek, Ben Hood Branch, Round Top Branch, Rice Creek, Sandy Branch (Bridge Creek, Reedy Branch, Tuppler Branch), Rocky Branch, Flat Branch, and Bear Creek (Donnington Branch). Further downstream, Big Branch enters Twentyfive Mile Creek followed by Yankee Branch, Jim Branch (Spring Branch), Briar Branch, Dodge Branch, Horsepen Creek (Wolfpit Branch), Bell Branch (Rock Branch), Cook Run, Flat Branch, and Beaverdam Branch before draining into the Wateree River. There are several ponds and lakes (10-75 acres) in the watershed used for recreation and irrigation, and a total of 255.5 stream miles in this watershed, all classified FW.

Water Quality

Twentyfive Mile Creek - Aquatic life uses are fully supported based on macroinvertebrate community data, and physical and chemical data. Significantly decreasing trends in five-day biochemical demand and total phosphorus concentration suggest improving conditions. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions.

Bear Creek - Aquatic life uses may be only partially supported due to a very high concentration of zinc measured in water in 1991. Although there were dissolved oxygen excursions, these were typical of values seen in blackwater systems and were considered natural, not standards violations. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
BEAR CREEK TRIB	SC0041378
KENNECOTT RIDGEWAY MINING CO.	MINOR INDUSTRIAL
PIPE #: 003 FLOW: M/R	EFFLUENT

HORSEPEN CREEK	SC0032395
ELGIN ESTATES	MINOR COMMUNITY
PIPE #: 001 FLOW: 0.015	WATER QUALITY
WQL FOR BOD_5, NH3-N, TRC, DO	

LAND APPLICATION SYSTEM	*ND#*
FACILITY NAME	*TYPE*
LAGOON	ND0067580
ROCK SPRINGS DEVELOPMENT	MINOR COMMUNITY

Landfill Activities

SOLID WASTE LANDFILL NAME	*PERMIT #*
FACILITY TYPE	*STATUS*
LUGOFF TRASH DUMP	DWP-917
MUNICIPAL	CLOSED

Mining Activities

MINING COMPANY	*PERMIT #*
MINE NAME	*MINERAL*
CAROLINA CERAMICS, INC.	0138-28
KERSHAW #2 CLAY MINE	SERICITE
CAROLINA CERAMICS, INC.	0403-40
MOBLEY ROAD MINE	SHALE

Growth Potential

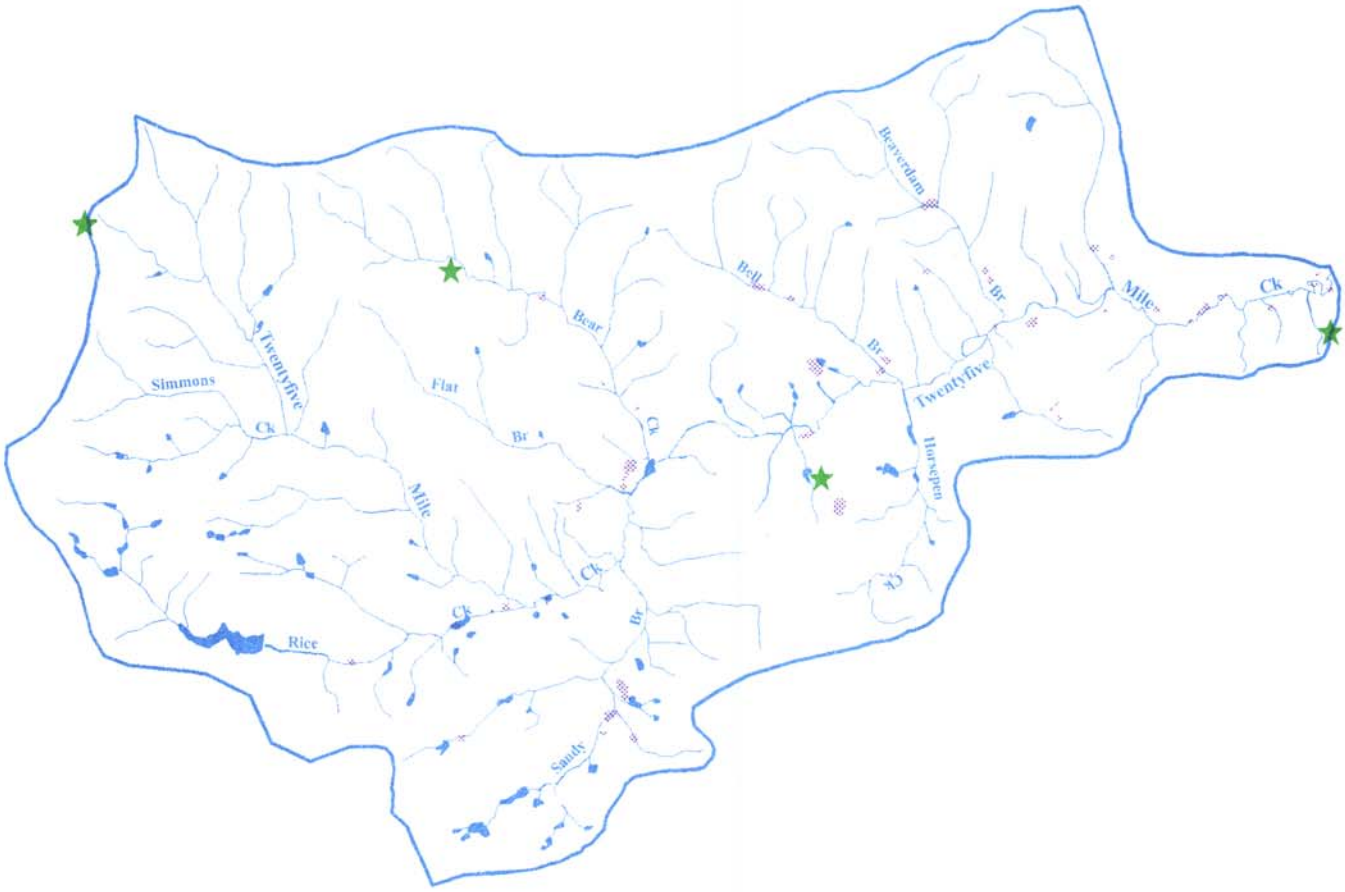
There is a high potential for continued (rapid) residential, commercial, and industrial growth in this watershed, with an emphasis along the U.S. 1 corridor between the Cities of Columbia and Camden. Sewer is provided to this area through a regional system located in Kershaw County.

Implementation Strategy

Recreational uses for Twentyfive Mile Creek and Bear Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. Aquatic life uses for Bear Creek are impaired from elevated zinc concentrations; an evaluation of the situation is ongoing.

Natural Resources

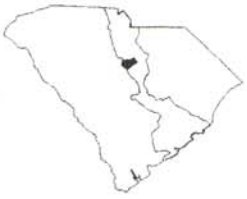
Twentyfive Mile Creek Watershed
(03050104-060)



Hydrography

Wetlands

Endangered Species

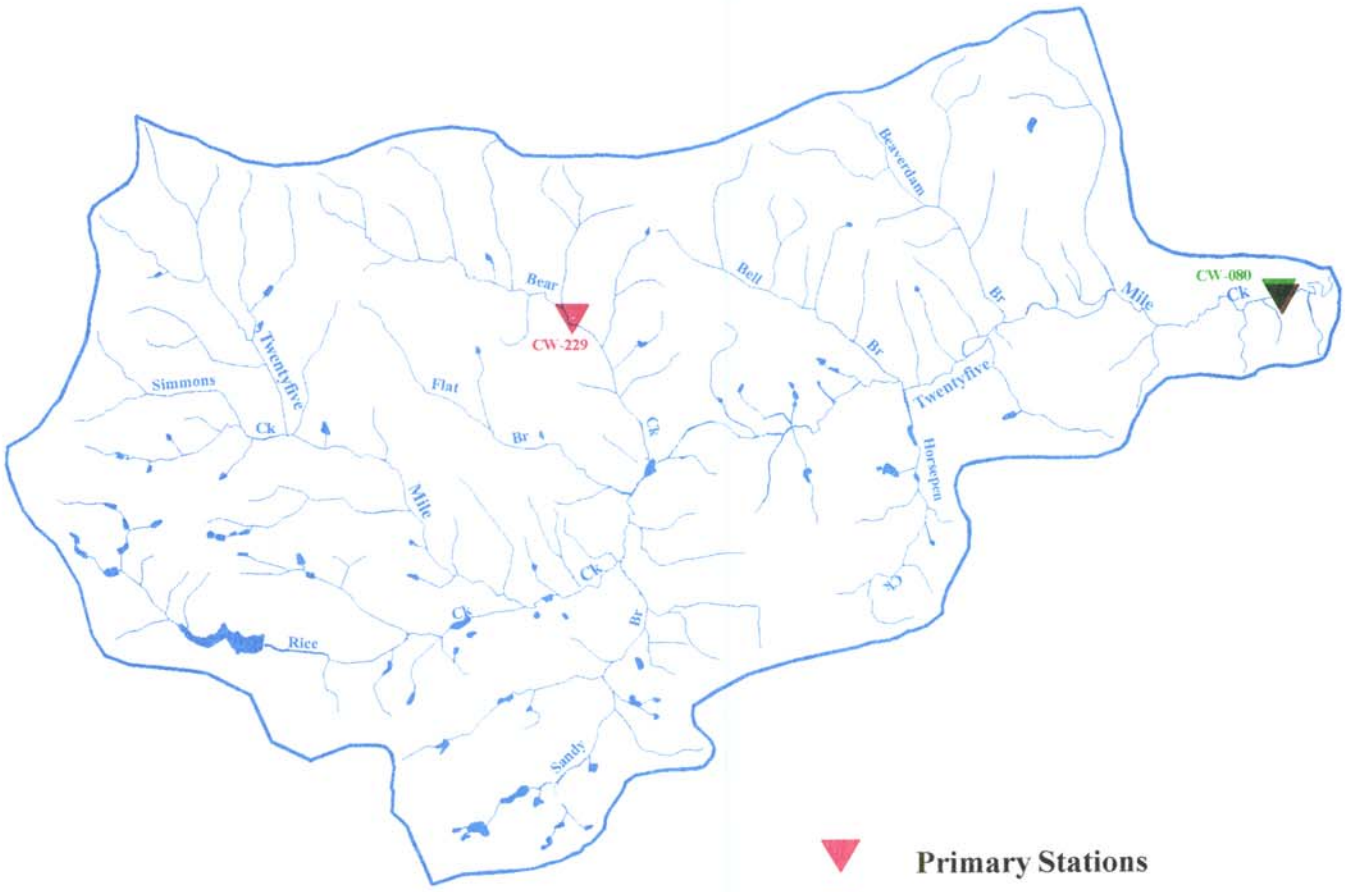


0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

Water Quality Monitoring Stations

Twentyfive Mile Creek Watershed
(03050104-060)



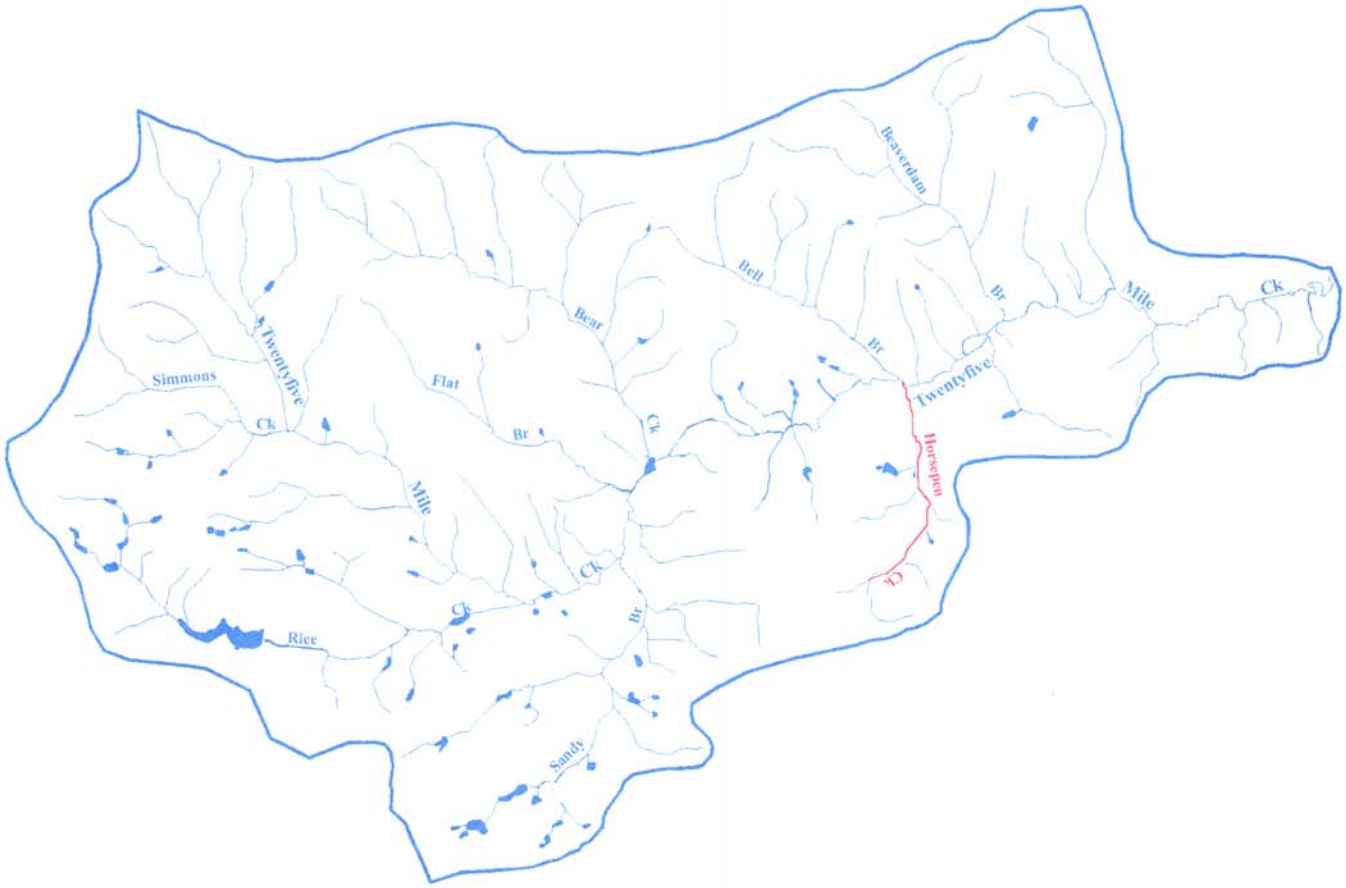
N

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

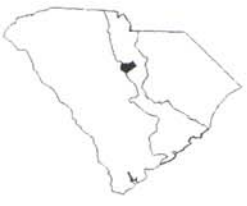
Streams Modeled for Wasteload Allocation

Twentyfive Mile Creek Watershed
(03050104-060)



Modeled Areas

Hydrography

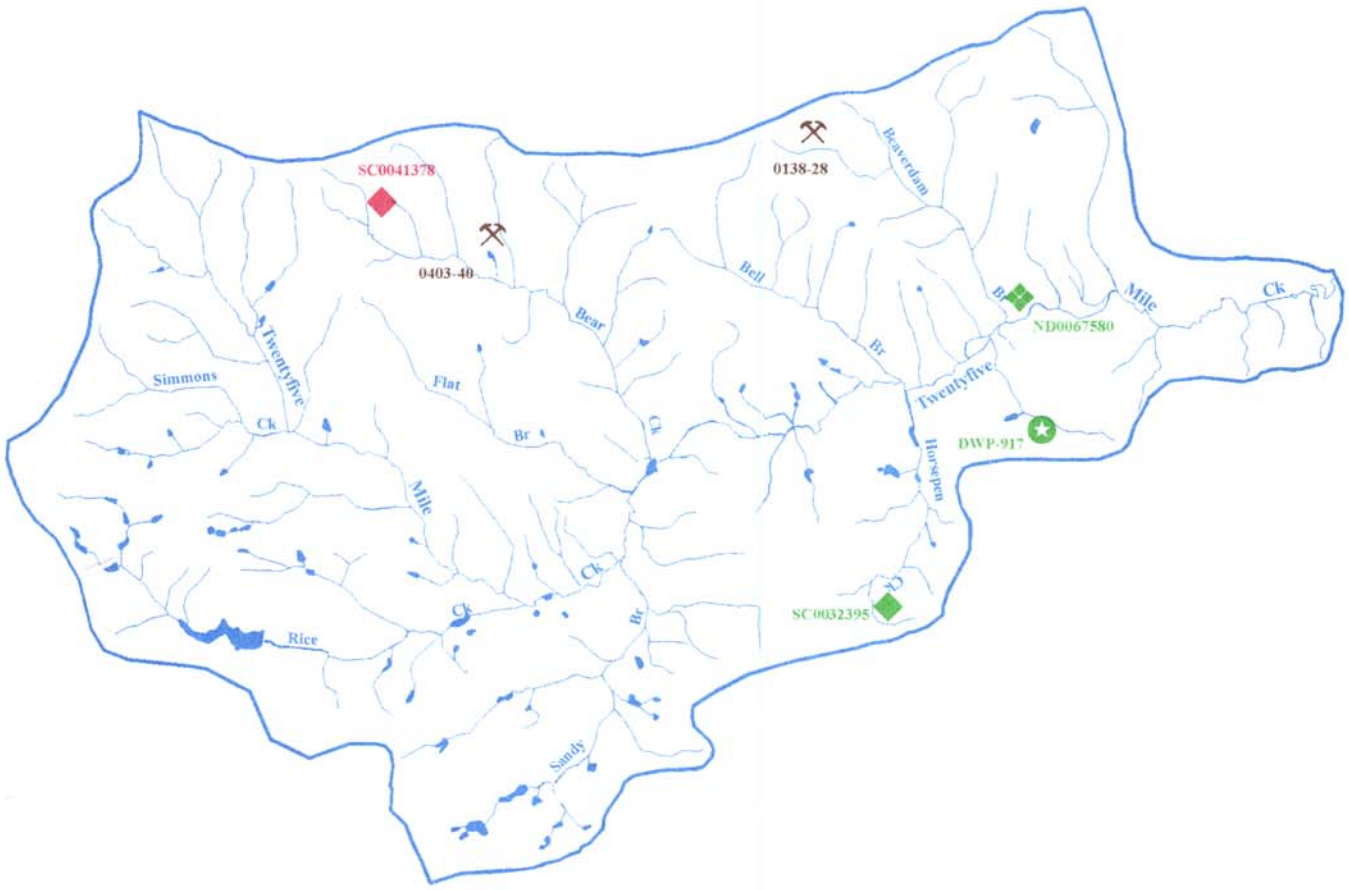


0 1 2 3 4 5 MILES

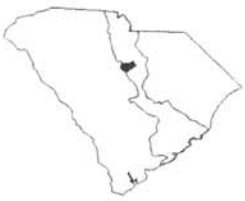
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Twentyfive Mile Creek Watershed
(03050104-060)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Closed Municipal Landfills
- Mining Activities
- Hydrography



0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

03050104-070

(Big Pine Tree Creek)

General Description

Watershed 03050104-070 is located in Kershaw County and consists primarily of ***Big Pine Tree Creek*** and its tributaries. The watershed occupies 42,938 acres of the Sandhills region of South Carolina. The predominant soil types consist of an association of the Lakeland-Wagram series. The erodibility of the soil (K) averages 0.10; the slope of the terrain averages 10%, with a range of 0-25%. Land use/land cover in the watershed includes: 7.78% urban land, 16.05% agricultural land, 5.35% scrub/shrub land, 0.09% barren land, 66.75% forested land, 2.24% forested wetland, and 1.74% water.

Big Pine Tree Creek flows through Llewellyn Millpond (20 acres) and accepts drainage from Beaverdam Branch, Thoroughfare Branch, Hyco Branch, and Berkeley Branch before flowing through Adams Mill Pond (160 acres) in N.R. Goodale State Park and Hermitage Mill Pond (600 acres). Thomas Branch drains into Hermitage Millpond, which is used for power generation, industry, water supply, and recreation. Downstream of Hermitage Mill Pond, Little Pine Tree Creek (Kendall Lake) joins Big Pine Tree Creek in the City of Camden and flows into the Wateree River. Kendall Lake (50 acres) is used for municipal, water supply, and irrigational purposes for the City of Camden. There are a total of 94.6 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: the entire waterbody within the Savage Bay Heritage Preserve - a noted Carolina Bay with unique features.

Water Quality

Big Pine Tree Creek - There are two SCDHEC monitoring sites along Big Pine Tree Creek. This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Excursions of dissolved oxygen and pH occurred at both sites; however, these were typical of values seen in blackwater systems, and as such were considered to be natural in origin, not standards violations. Aquatic life uses are fully supported at the upstream site. A high concentration of zinc was measured in water in 1992. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions under Class FW standards. Aquatic life uses are also fully supported at the downstream site, but may be threatened by a significantly decreasing trend in pH. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. Recreational uses are fully supported, and a significantly decreasing trend in fecal coliform bacteria concentrations suggest improving conditions.

Little Pine Tree Creek - Aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened by a significantly increasing trend in turbidity. Although there were pH excursions, these were typical of values seen in blackwater systems and were considered natural, not

standards violations. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions.

Adams Mill Pond - Categorized as a minor lake, Adams Mill Pond has a watershed covering 128.7 km^2, a surface area of 64.8 hectares, and a maximum and mean depth of 4.6m and 1.0m, respectively. Recreational usages of the pond such as swimming and boating may be impaired due to the abundant submerged aquatic plants that occur lakewide. This lake has been treated annually by the Water Resources Division of the SCDNR for the past six years with aquatic herbicides in an attempt to control the growth of aquatic macrophytes that have impaired the lake's recreational uses. Fishing near the dam may also be impaired due to the low DO levels (<5.0 mg/l). Adams Mill Pond is a black water swamp, therefore the above DO conditions are considered natural. Eutrophication studies classified the pond as Category III for the least eutrophic condition and preservation is recommended.

Kendall Lake - This lake was also treated in 1994 by the SCDNR to control aquatic plants and reclaim recreational areas for swimming and boating. The plan includes both herbicide application and stocking of 375 grass carp (15 fish/vegetated acre).

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
BIG PINE TREE CREEK GOODALE STATE PARK	28-N01 ACTIVE
BIG PINE TREE CREEK HERMITAGE MILL POND	NO PERMIT ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
BIG PINE TREE CREEK DEROYAL TEXTILES PIPE #: 001 FLOW: 0.1354	SC0002518 MAJOR INDUSTRIAL EFFLUENT
HERMITAGE MILL POND TRIB CAMDEN MILITARY ACADEMY PIPE #: 001 FLOW: 0.005 WQL FOR NH3-N, TRC	SC0033502 MINOR COMMUNITY WATER QUALITY

Landfill Activities

There is one active construction landfill in this watershed.

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
KERSHAW COUNTY LANDFILL MUNICIPAL	DWP-035 ACTIVE
OLD CAMDEN CITY DUMP MUNICIPAL	DWP-008 CLOSED
COLUMBIA ORGANIC CHEMICAL INDUSTRIAL	—— CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
PALMETTO BRICK COMPANY YOUNG MINE	0629-28 KAOLIN
PALMETTO BRICK COMPANY HINES MINE	0995-28 SHALE

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
CITY OF CAMDEN (M)	LITTLE PINE TREE CREEK	2.06

Growth Potential

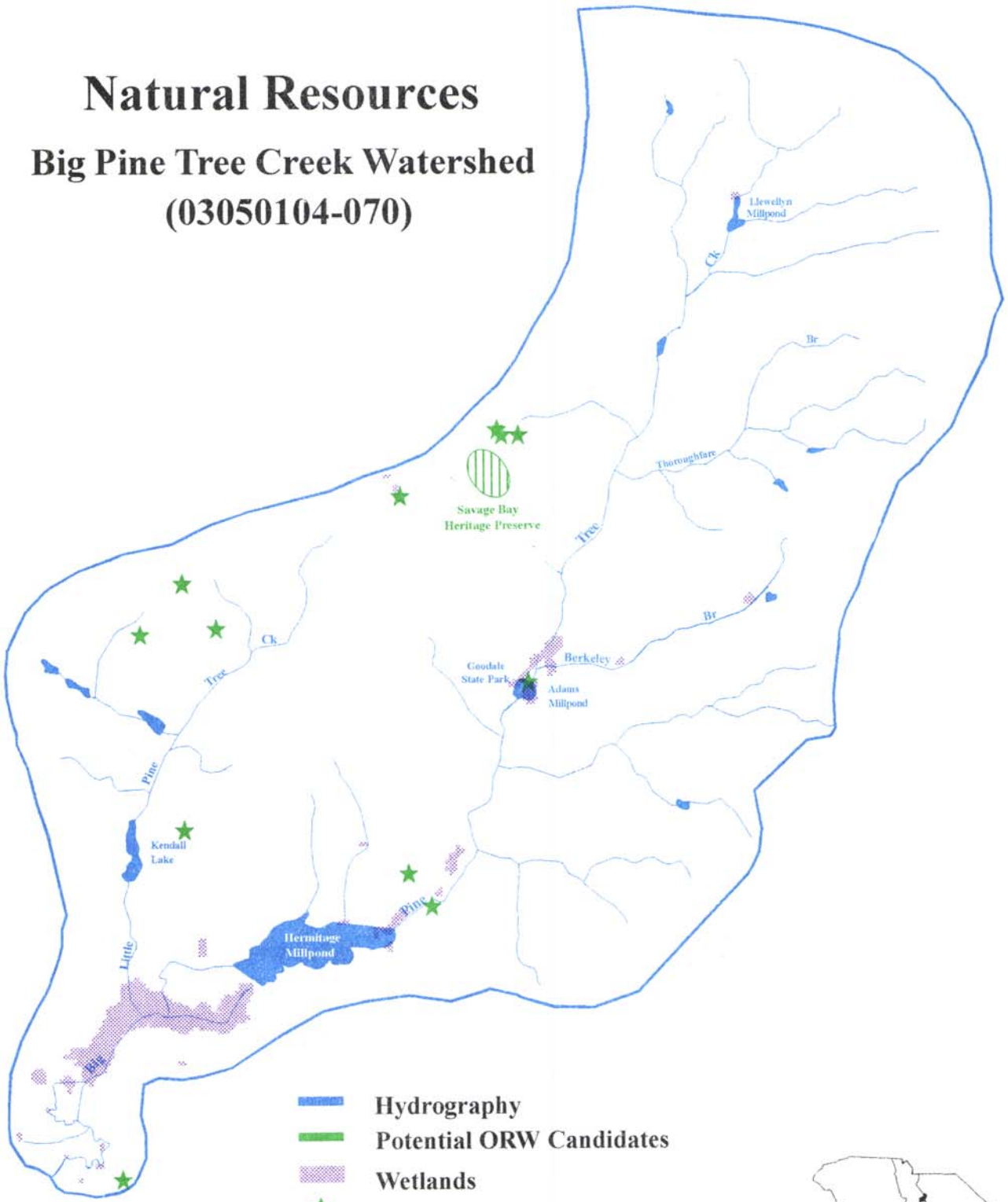
There is a high potential for continued residential, commercial, and industrial development in this watershed, which contains a portion of the City of Camden. U.S. 1 and U.S. 521, together with I-20 provide the growth corridors. The interchange of I-20 and U.S. 521 has a particularly high development potential. Sewer is provided to this area through a regional system located in Kershaw County.

Implementation Strategy

Recreational uses on Big Pine Tree Creek and Little Pine Tree Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

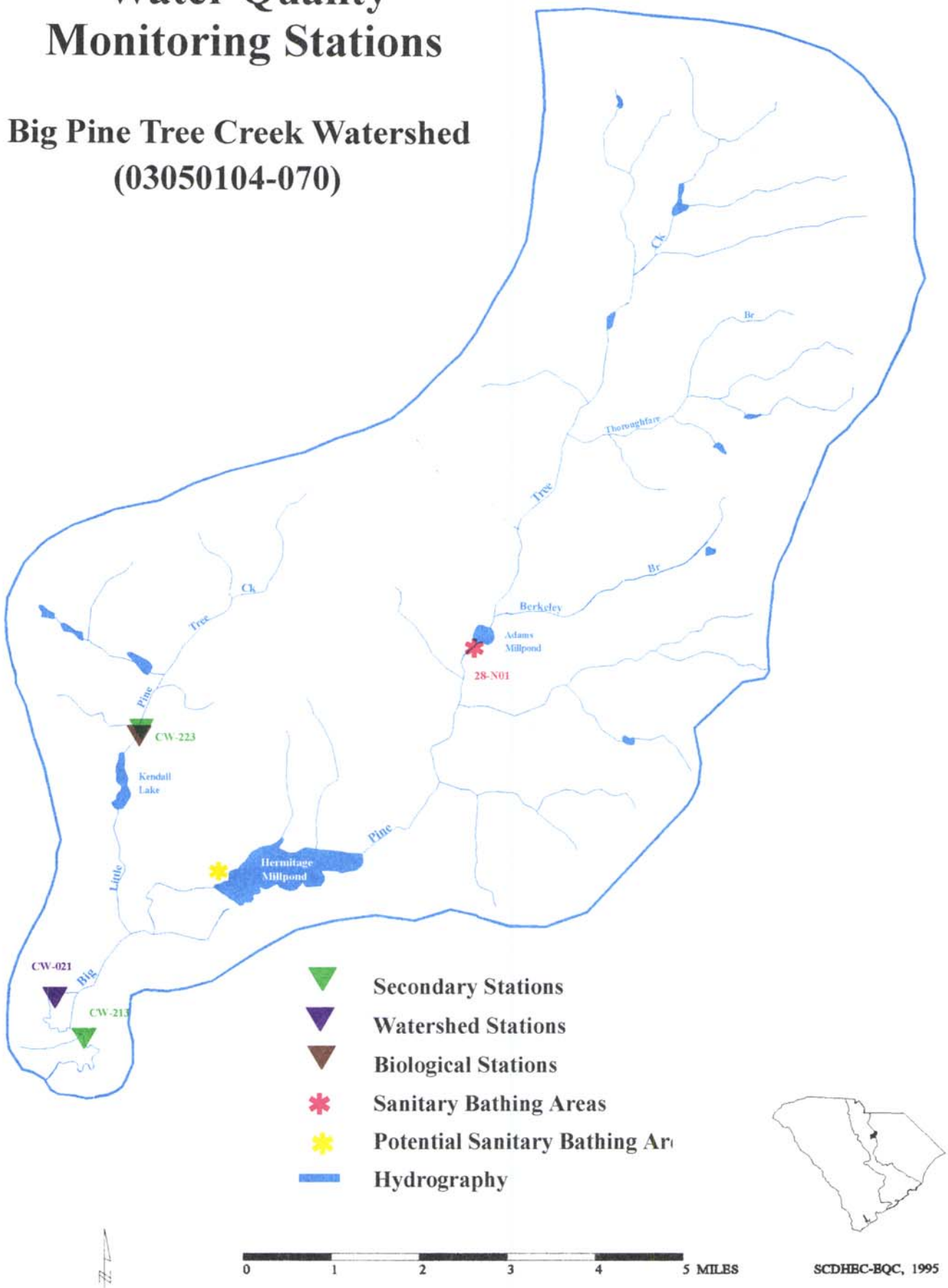
Natural Resources

Big Pine Tree Creek Watershed (03050104-070)



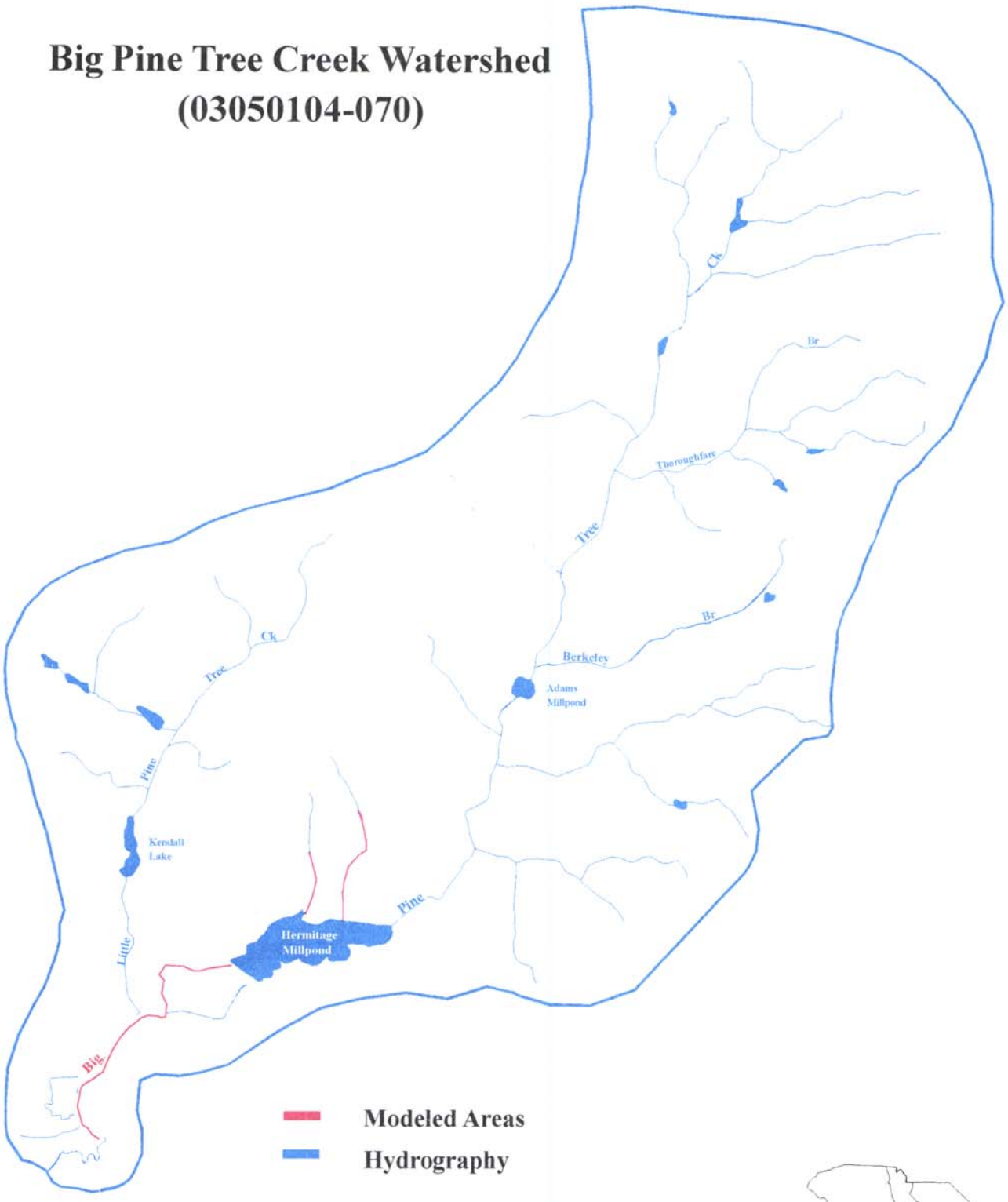
Water Quality Monitoring Stations

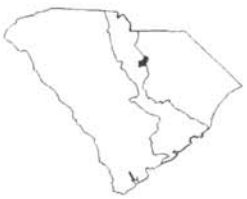
Big Pine Tree Creek Watershed (03050104-070)



Streams Modeled for Wasteload Allocation

Big Pine Tree Creek Watershed (03050104-070)

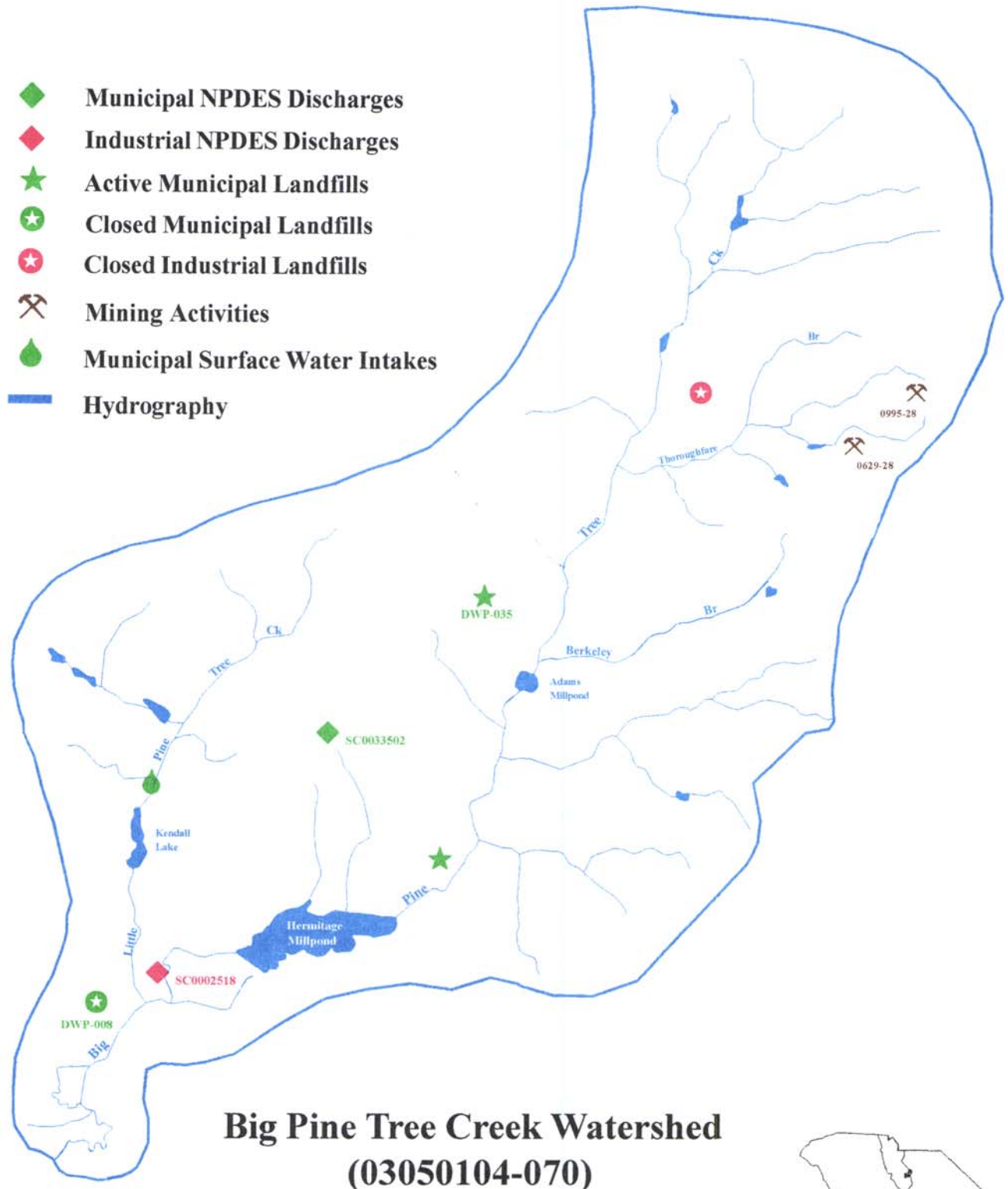




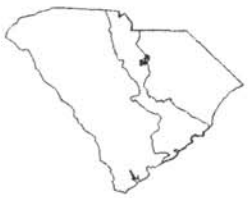
0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality



Big Pine Tree Creek Watershed (03050104-070)



SCDHEC-BQC, 1995

03050104-080

(Swift Creek)

General Description

Watershed 03050104-080 is located in Kershaw, Sumter, and Lee Counties and consists primarily of ***Swift Creek*** and its tributaries. The watershed occupies 42,577 acres of the Sandhills and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Vaucluse-Pelion-Wagram-Lucy series. The erodibility of the soil (K) averages 0.12; the slope of the terrain averages 7%, with a range of 2-15%. Land use/land cover in the watershed includes: 0.37% urban land, 31.56% agricultural land, 14.75% scrub/shrub land, 0.06% barren land, 47.11% forested land, 4.60% forested wetland, 0.07% nonforested wetland, and 1.49% water.

Swift Creek is joined by Little Swift Creek and flows through Boykins Mill Pond (200 acres) and White Oak Slash Lake (120-acres) before draining into the Wateree River. The ponds are used for water supply, irrigation, and recreation. There are a total of 141.3 stream miles in this watershed, all classified FW.

Water Quality

Swift Creek - Aquatic life and recreational uses are fully supported for this site. Although there were dissolved oxygen and pH excursions, these were typical of values seen in blackwater systems, and as such were considered natural, not standards violations.

Activities Potentially Affecting Water Quality

Nonpoint Source Contributions

Swift Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen concerns.

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
SC DEPT OF CORR. CAMDEN (HAGOOD) PLANT	0091-43 SAND/GRAVEL

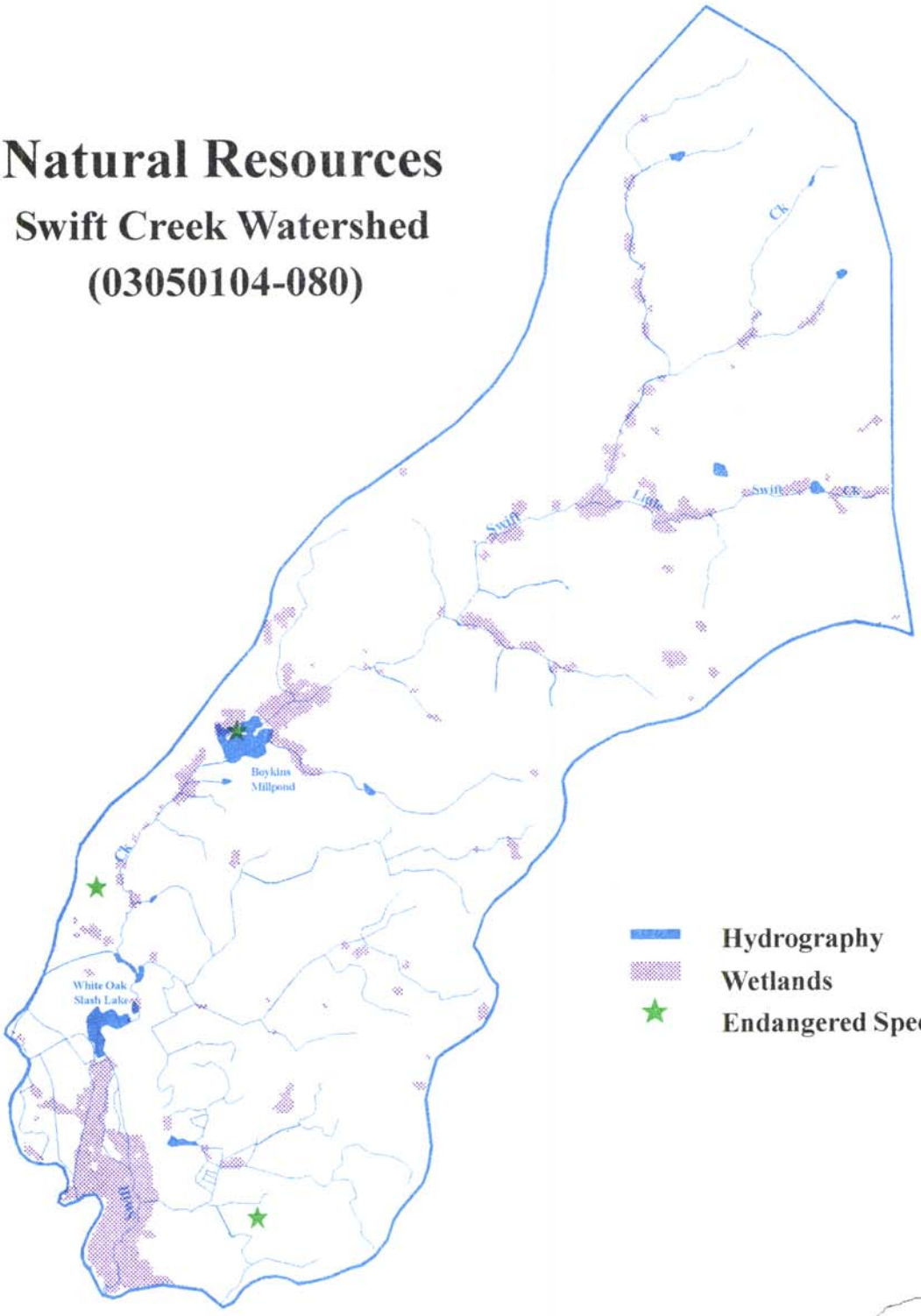
Growth Potential

There is a low potential for growth in this watershed.

Natural Resources

Swift Creek Watershed

(03050104-080)



Hydrography

Wetlands

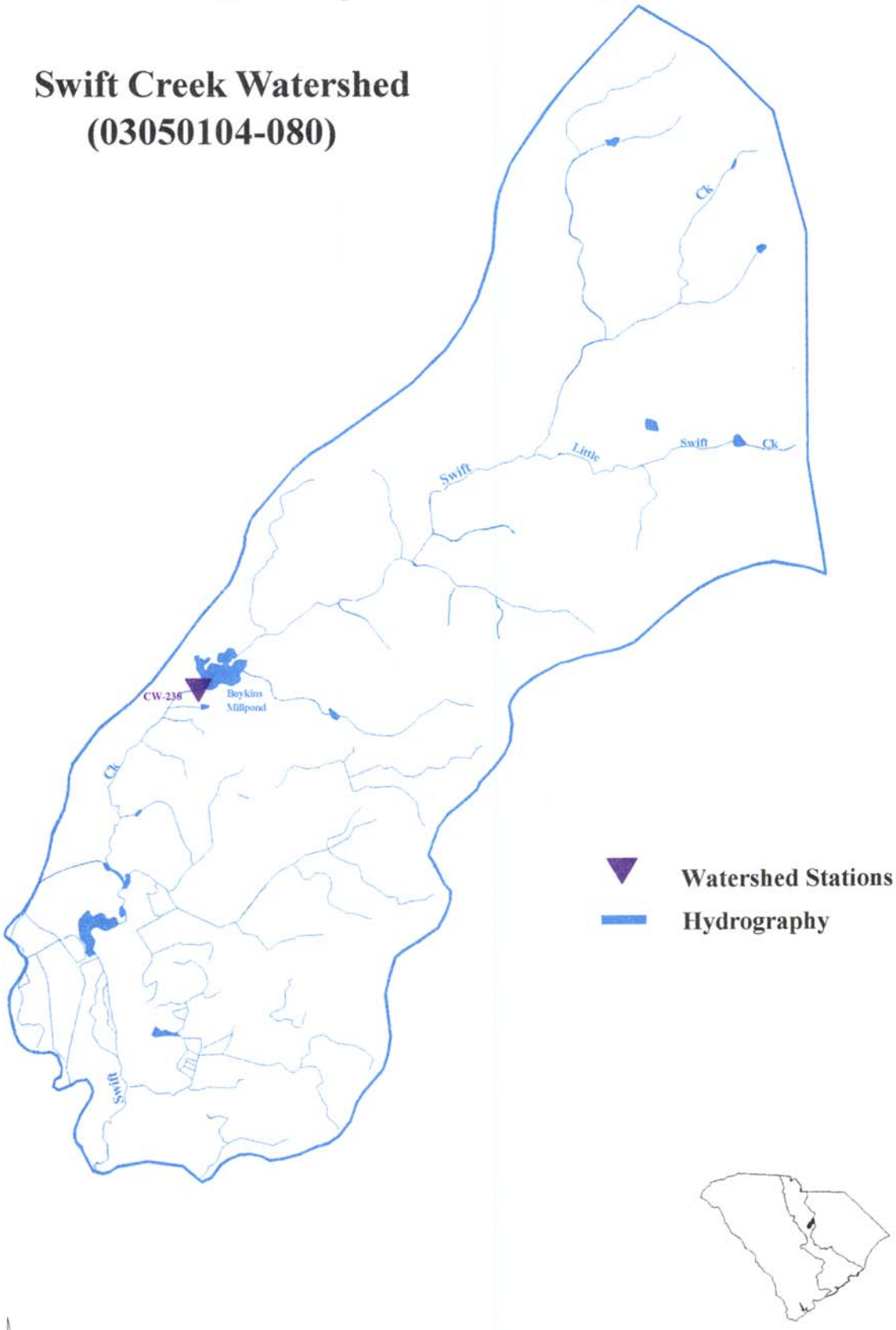
Endangered Species

0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

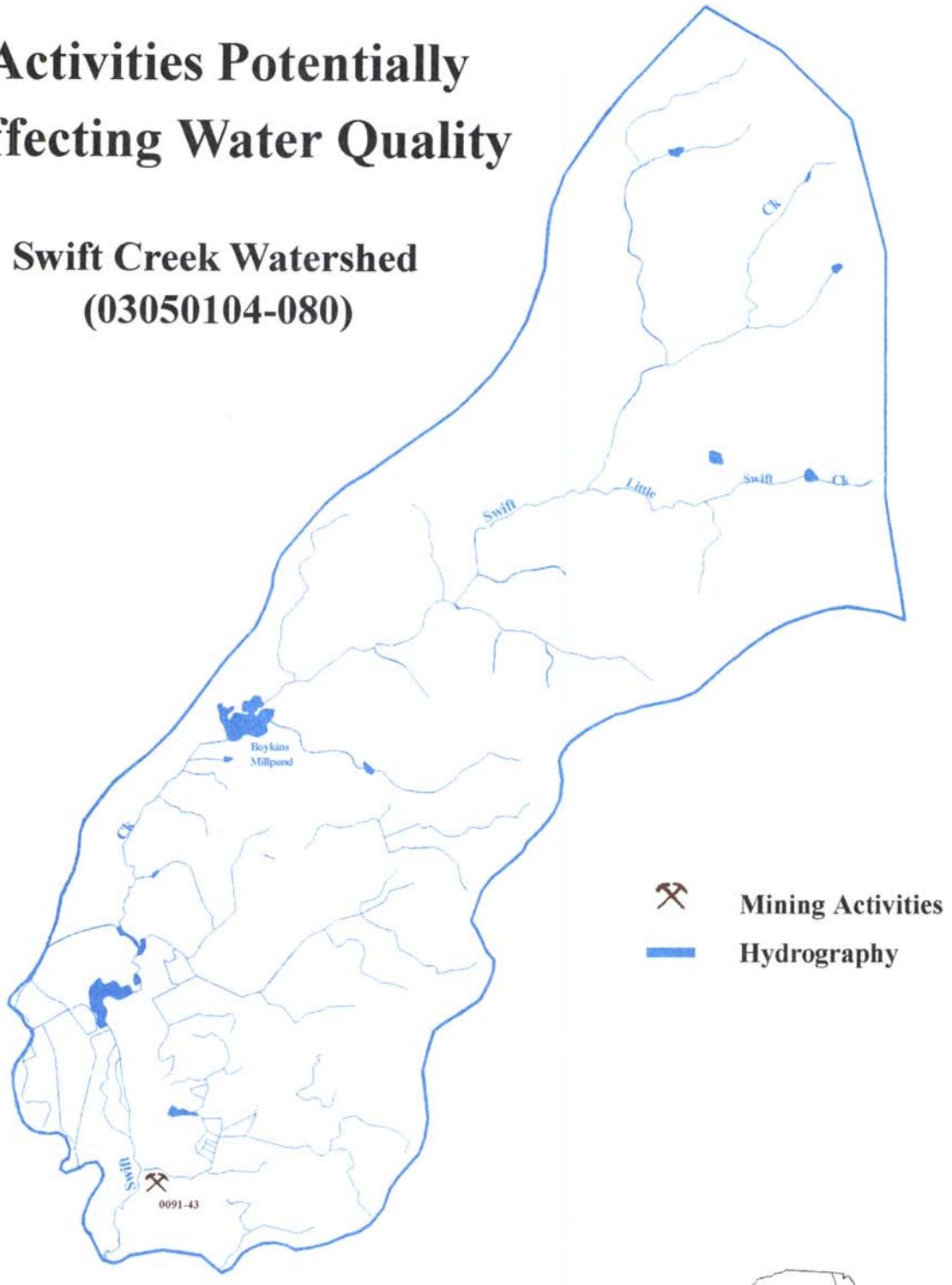
Water Quality Monitoring Stations

Swift Creek Watershed
(03050104-080)



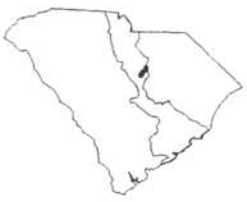
Activities Potentially Affecting Water Quality

Swift Creek Watershed (03050104-080)



Mining Activities

Hydrography



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050104-090

(Spears Creek)

General Description

Watershed 03050104-090 is located in Kershaw and Richland Counties and consists primarily of ***Spears Creek*** and its tributaries. The watershed occupies 50,448 acres of the Sandhills region of South Carolina. The predominant soil types consist of an association of the Lakeland-Wagram-Chastain-Chewacla series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 7%, with a range of 0-25%. Land use/land cover in the watershed includes: 2.41% urban land, 9.02% agricultural land, 6.73% scrub/shrub land, 0.05% barren land, 67.77% forested land, 12.60% forested wetland, and 1.43% water.

Spears Creek originates near the Town of Elgin and flows past Fort Jackson U.S. Army Base before draining into the Wateree River. Spears Creek flows through several small lakes including an unnamed 85-acre lake before accepting the drainage of Sloan Branch, Kelly Creek (White Pond), Haig Creek, McCaskill Creek (Runander Branch, Otterslide Branch), and Raglins Creek. Further downstream Madraw Branch, Moke Branch, and Pigeon Roost Branch enter Spears Creek near its confluence with the Wateree River. There are a total of 161.3 stream miles in this watershed, all classified FW.

Water Quality

Spears Creek - There are two SCDHEC monitoring sites along Spears Creek. Excursions of pH occurred at both sites; however, these were typical of values seen in blackwater systems and were considered natural, not standards violations. Aquatic life uses are fully supported at the upstream site based on macroinvertebrate community data, but may be threatened by a significantly increasing trend in turbidity. A significantly increasing trend in dissolved oxygen and significant decreasing trends in five-day biochemical oxygen demand and total phosphorus suggest improving conditions. P,P'DDD, a metabolite of DDT, was detected in the 1989 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions. Aquatic life uses are also fully supported at the downstream site. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Kelly Creek - Aquatic life uses are fully supported based on macroinvertebrate data, and physical and chemical data. Although there were pH excursions, these were typical of values seen in blackwater systems and were considered natural, not standards violations. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions. Recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
SPEARS CREEK THE VALHALLA COMPANY PIPE #: 001 FLOW: 0.355 WQL FOR TRC, DO, NH_3-N, BOD_5	SC0043494 MINOR COMMUNITY WATER QUALITY
SLOAN BRANCH LOVELESS & LOVELESS, INC. PIPE #: 001 FLOW: M/R	SC0041815 MINOR INDUSTRIAL EFFLUENT

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD WILDWOOD UTIL. REG. WWTP	ND0068411 MINOR COMMUNITY
TILE FIELD HACIENDA MOBILE HOME ESTATES	ND0067598 MINOR COMMUNITY
SPRAYFIELD HOMELITE/TEXTRON	ND0072818 MINOR INDUSTRIAL

Nonpoint Source Contributions

Kelly Creek is included on the §319 list of waters impacted by land disposal sites. There is an abandoned industrial pit near the creek. Water samples collected by the Department indicate elevated levels of toxic materials on numerous occasions. Kelly Creek is also included on the §304(l) long list of waters impacted by ambient toxicity.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CHAMBERS RICHLAND CO. LANDFILL MUNICIPAL	DWP-126 ACTIVE
YANDLE BROTHERS LANDFILL MUNICIPAL	DWP-028 ACTIVE
NORTHEAST MUNICIPAL	DWP-134 ACTIVE
LOVELESS & LOVELESS, INC. CONSTRUCTION	NO PERMIT ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CAROLINA CERAMICS, INC. KOON CLAY MINE	0137-28 KAOLIN
TAYLOR CLAY PRODUCTS CO. DUNCAN LAKES MINE	0198-28 KAOLIN
TAYLOR CLAY PRODUCTS CO. TAYLOR MINE	0830-28 KAOLIN
RICHTEX CORP. GADSON PIT	0409-28 KAOLIN
RICHTEX CORP. COLEMAN MINE	0185-40 KAOLIN
LOVELESS & LOVELESS, INC. SCREAMING EAGLE ROAD PIT	0492-28 SAND
HARDAWAY CONCRETE COMPANY, INC. NORTHEAST MINE	0507-40 SAND
CHAMBERS RICHLAND CO. LANDFILL, INC. SCREAMING EAGLE ROAD MINE	0700-40 KAOLIN
TNT SAND TNT SAND MINE	0898-40 SAND

Ground Water Concerns

The ground water in the vicinity of the surface impoundments owned by Hardwicke Chemical is contaminated with volatile organics, and is affecting Kelly Creek. The facility is currently in the assessment and remediation phase. Also affecting a Spears Creek tributary is the chromium contaminated ground water in the vicinity of the surface impoundments owned by Homelite Textron (formerly Townsend Saw Chain). This is a U.S. EPA National Pollution list site and remedial action is in progress. Additional remedial actions are anticipated after ongoing investigations have been completed.

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
HARDWICK CHEMICAL CO. (I)	SPEARS CREEK	0.70

Growth Potential

There is a moderate to high potential for residential, commercial, and industrial growth in this watershed. I-20 crosses the area, together with U.S. 601 and U.S. 1, and S.C. 12. There are also several large and growing subdivisions, the Richland County Industrial Park, and a privately owned

solid waste landfill to add to future growth in the area. Sewer is provided to this area through a regional system located in Kershaw County, together with two small sewer treatment facilities. The Areawide 208 Water Quality Management Plan calls for elimination of these two facilities and treatment of the waste by a regional facility. Water service is available from the City of Columbia's water system.

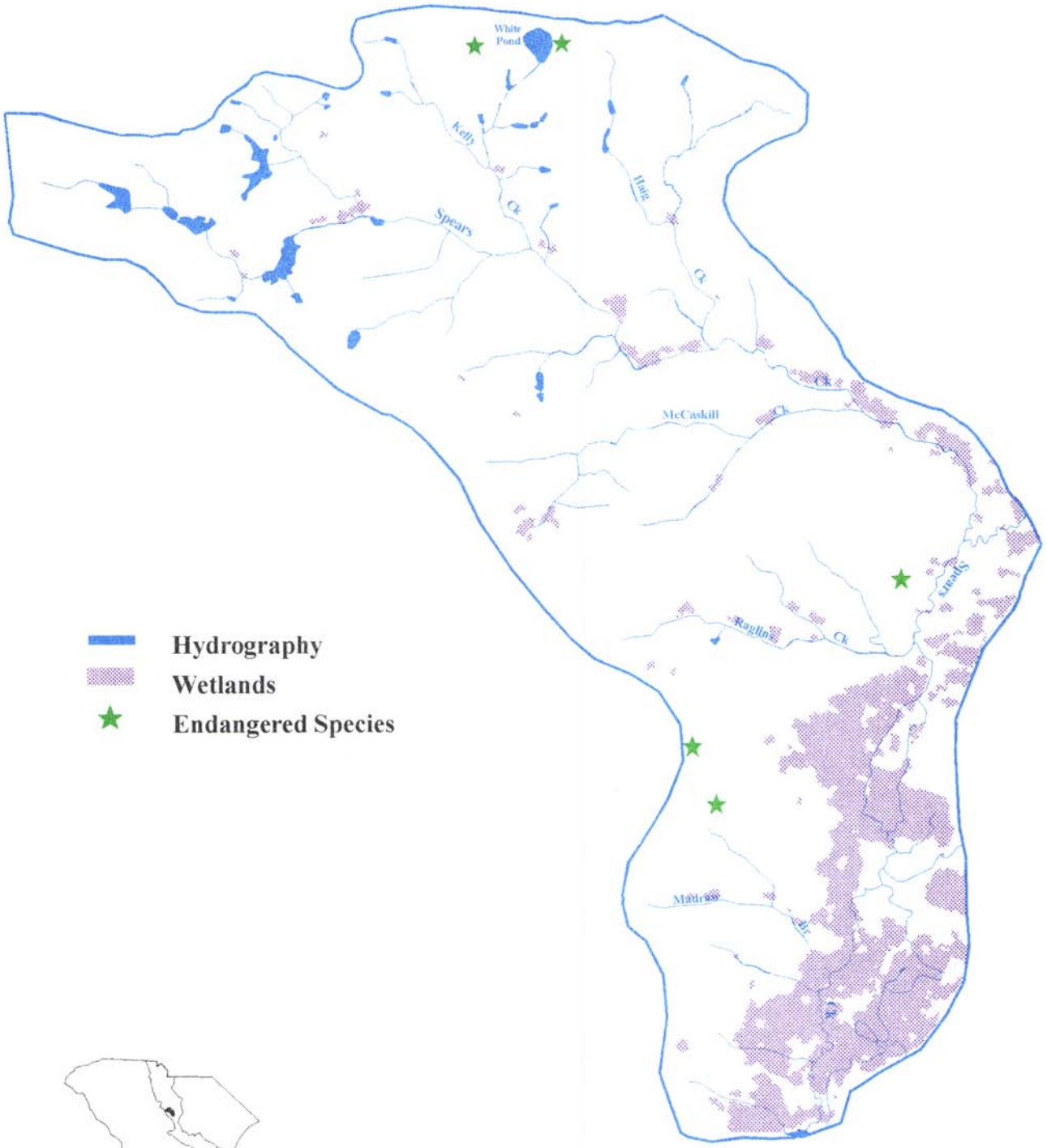
Implementation Strategy

Recreational uses for Spears Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. Spears Creek is further impaired by ground water contaminated with organics and chromium. One facility is in the assessment and remediation phase and the other has remedial action in progress.

Natural Resources

Spears Creek Watershed

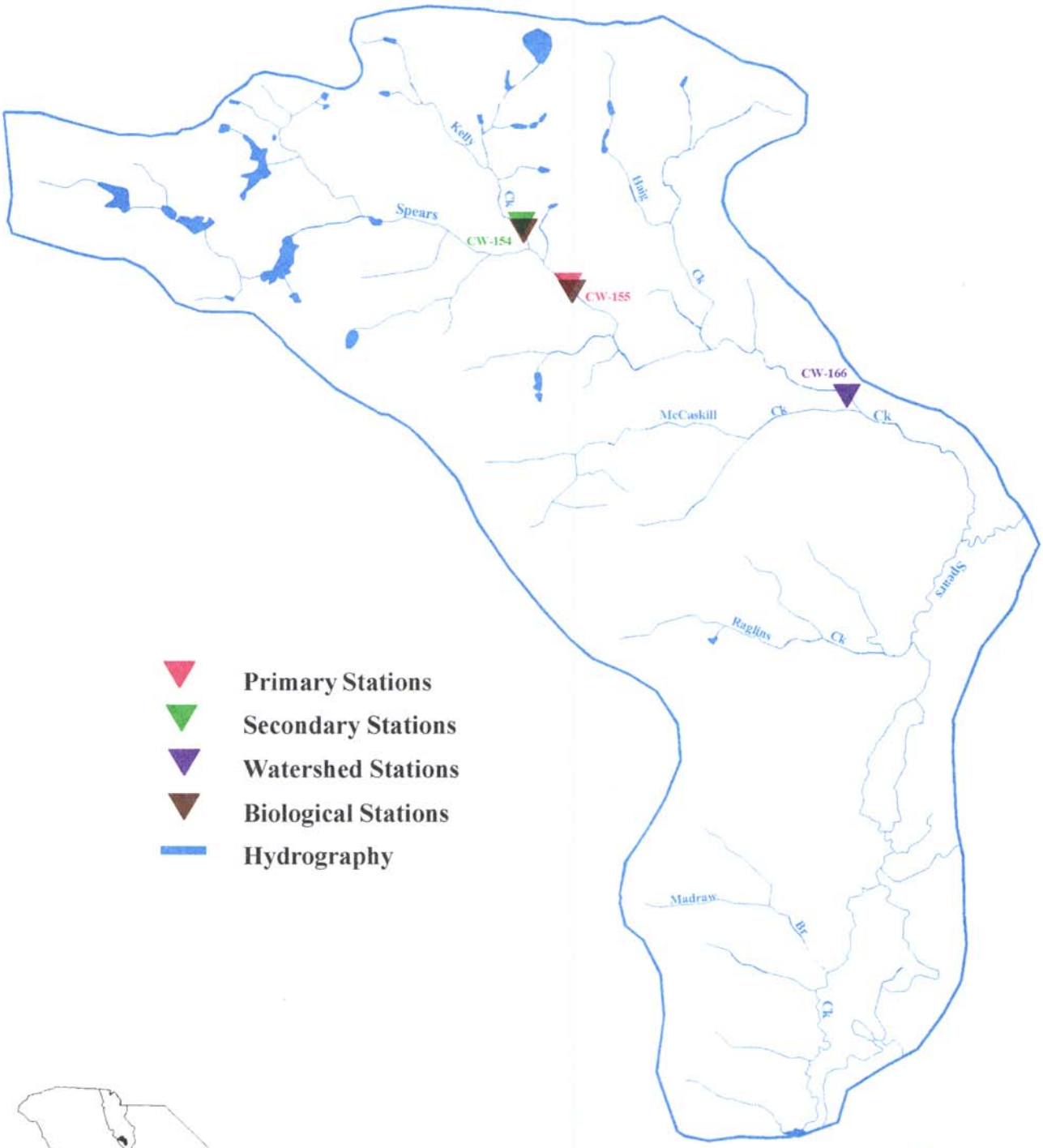
(03050104-090)

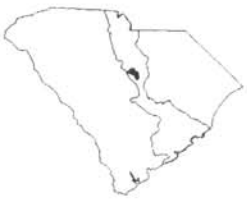


SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Spears Creek Watershed
(03050104-090)



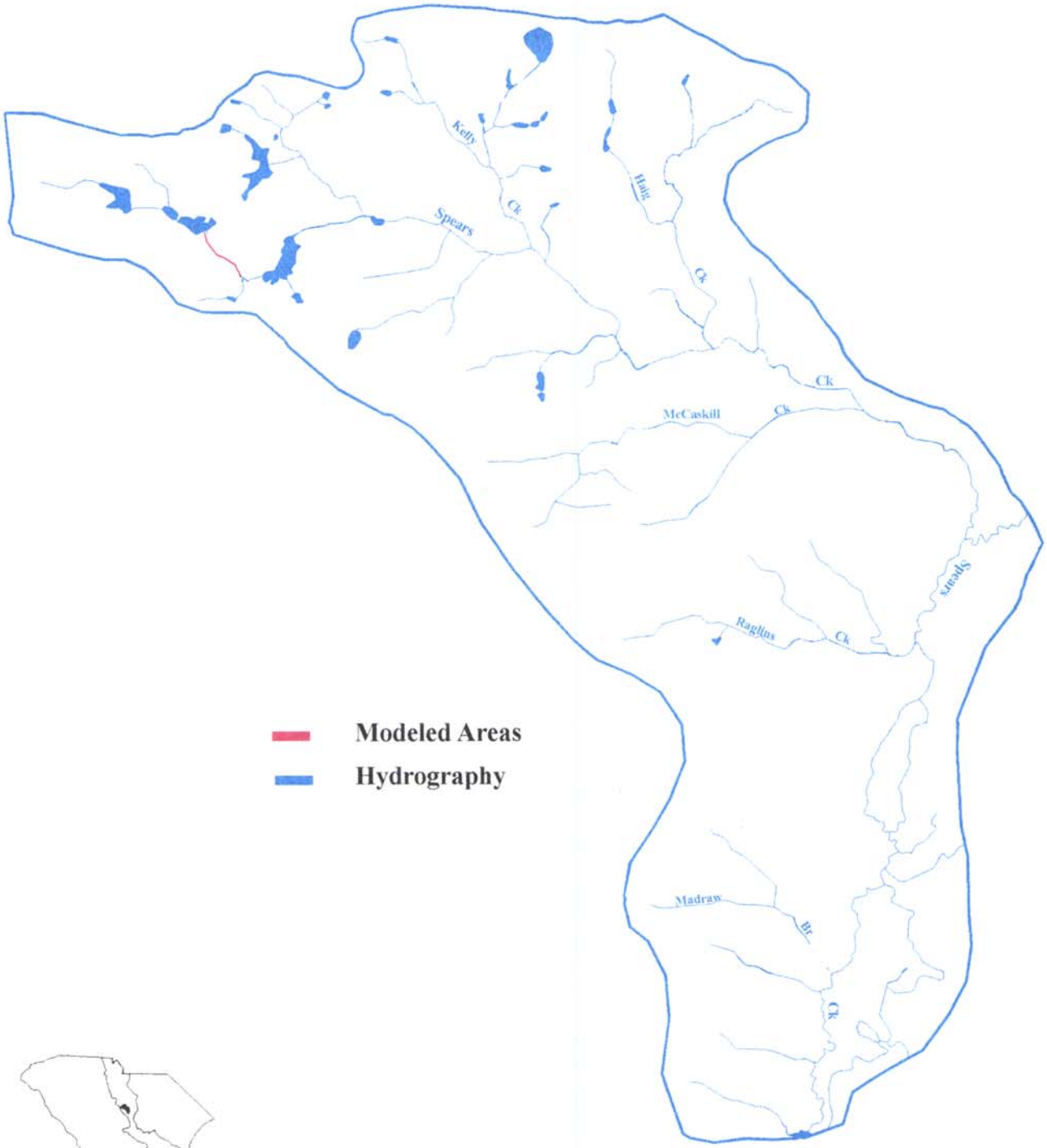


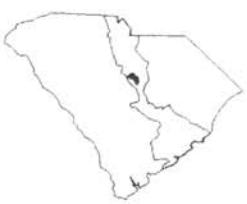
SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Streams Modeled for Wasteload Allocation

Spears Creek Watershed
(03050104-090)





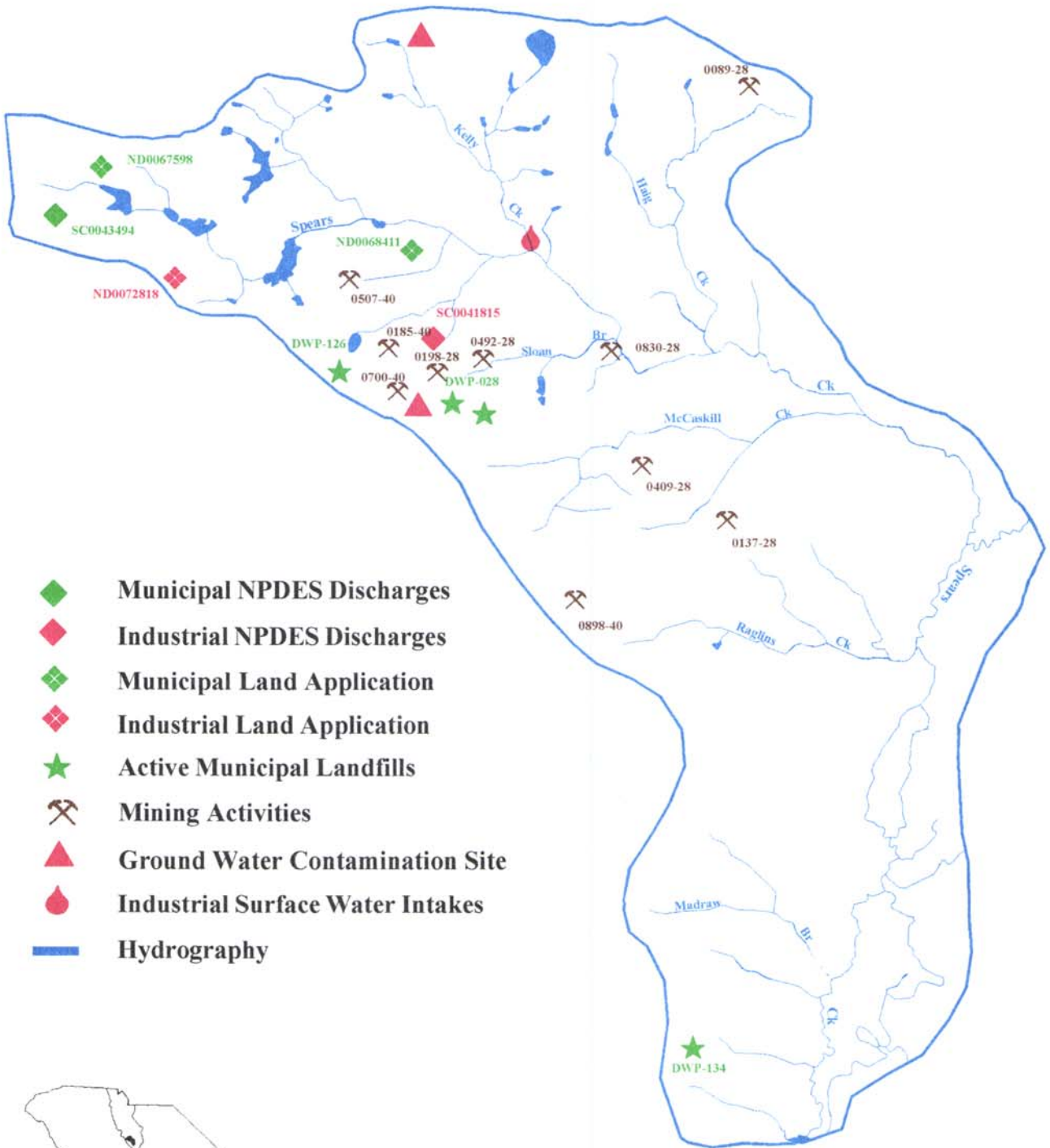
SCDHEC-EQC, 1995

0 1 2 3 4 5 MILES

Activities Potentially Affecting Water Quality

Spears Creek Watershed

(03050104-090)



SCDHEC-EQC, 1995

03050104-100

(Colonels Creek)

General Description

Watershed 03050104-100 is located in Richland County and consists primarily of ***Colonels Creek*** and its tributaries. The watershed occupies 47,839 acres of the Sandhills and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Vaucluse-Ailey-Alpin series. The erodibility of the soil (K) averages 0.12; the slope of the terrain averages 7%, with a range of 2-15%. Land use/land cover in the watershed includes: 0.72% urban land, 4.96% agricultural land, 0.57% scrub/shrub land, 0.11% barren land, 86.51% forested land, 5.82% forested wetland, and 1.31% water.

Colonels Creek originates near the Town of Pontiac and flows through the Fort Jackson U.S. Army Base property and into the Wateree River. Colonels Creek flows through DuPre Pond (35 acres) and Messers Pond (47 acres), and accepts drainage from Buffalo Creek and Bee Branch on U.S. property. Colonels Creek then accepts drainage from Jumping Run Creek and Leesburg Branch before flowing through Murray Pond (200 acres) and Goodwill Pond (120 acres). There are additional recreational ponds in the watershed and a total of 101.1 stream miles, all classified FW.

Water Quality

Colonels Creek - Aquatic life and recreational uses are fully supported. Although there were pH excursions, these were typical of values seen in blackwater systems and were considered natural, not standards violations.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
COLONELS CREEK - DITCH SC NATL GUARD/TRAINING UNIT PIPE #: 001 FLOW: M/R STORMWATER RUNOFF	SC0046108 MINOR INDUSTRIAL
LEESBURG BRANCH US MARINE CORP. PIPE #: 001 FLOW: M/R	SC0038792 MINOR INDUSTRIAL EFFLUENT

Landfill Activities

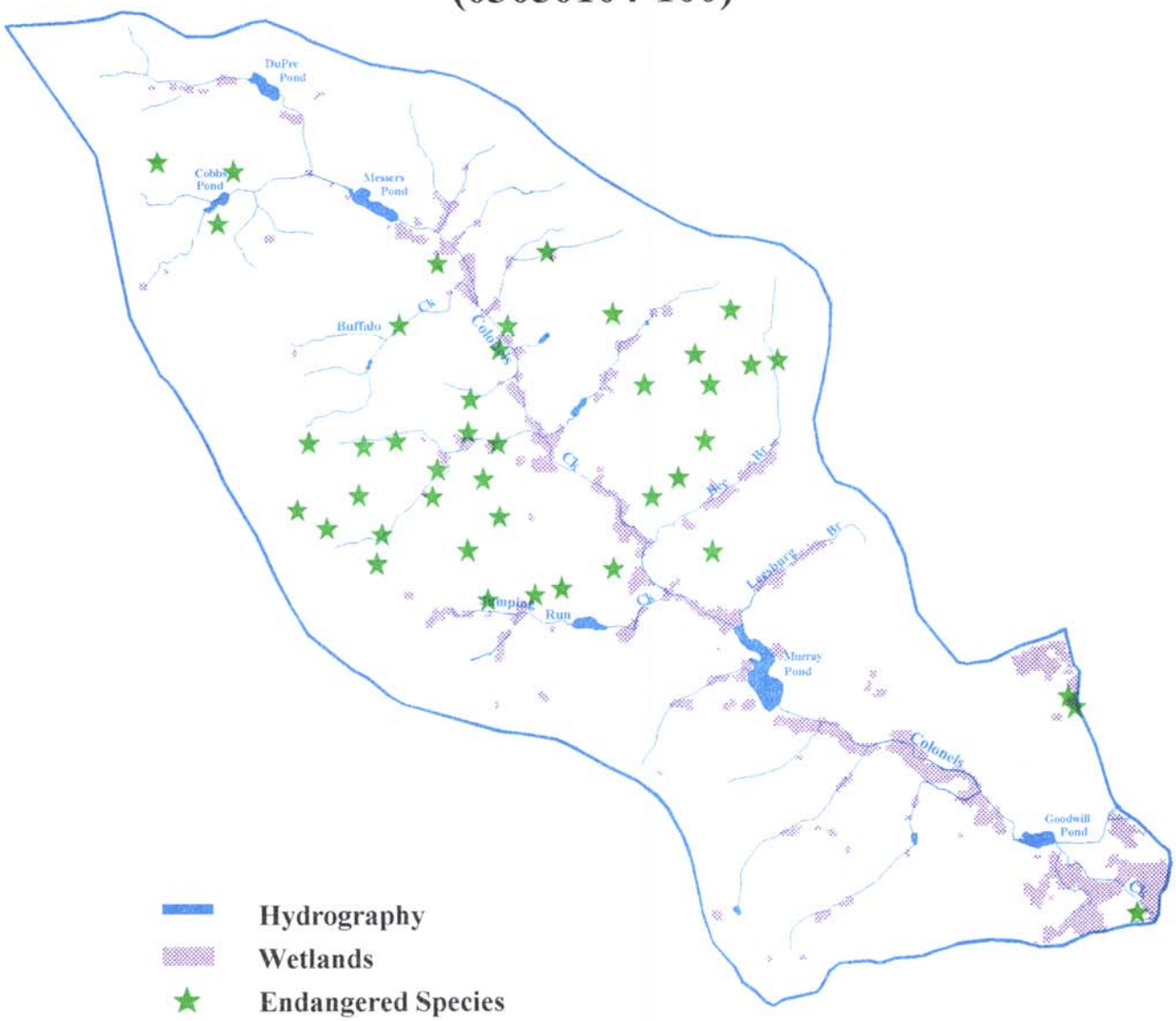
SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CAROLINA GRADING INC. INDUSTRIAL	IWP-223 ACTIVE

Growth Potential

There is a low potential for growth in this watershed, which contains the eastern portion of Fort Jackson. Percival Road and I-20 run along the top of the watershed, and water and sewer is only available there and near the Leesburg Road/Fort Jackson area. There are some rural residential areas in the Leesburg Road area.

Natural Resources

Colonels Creek Watershed
(03050104-100)

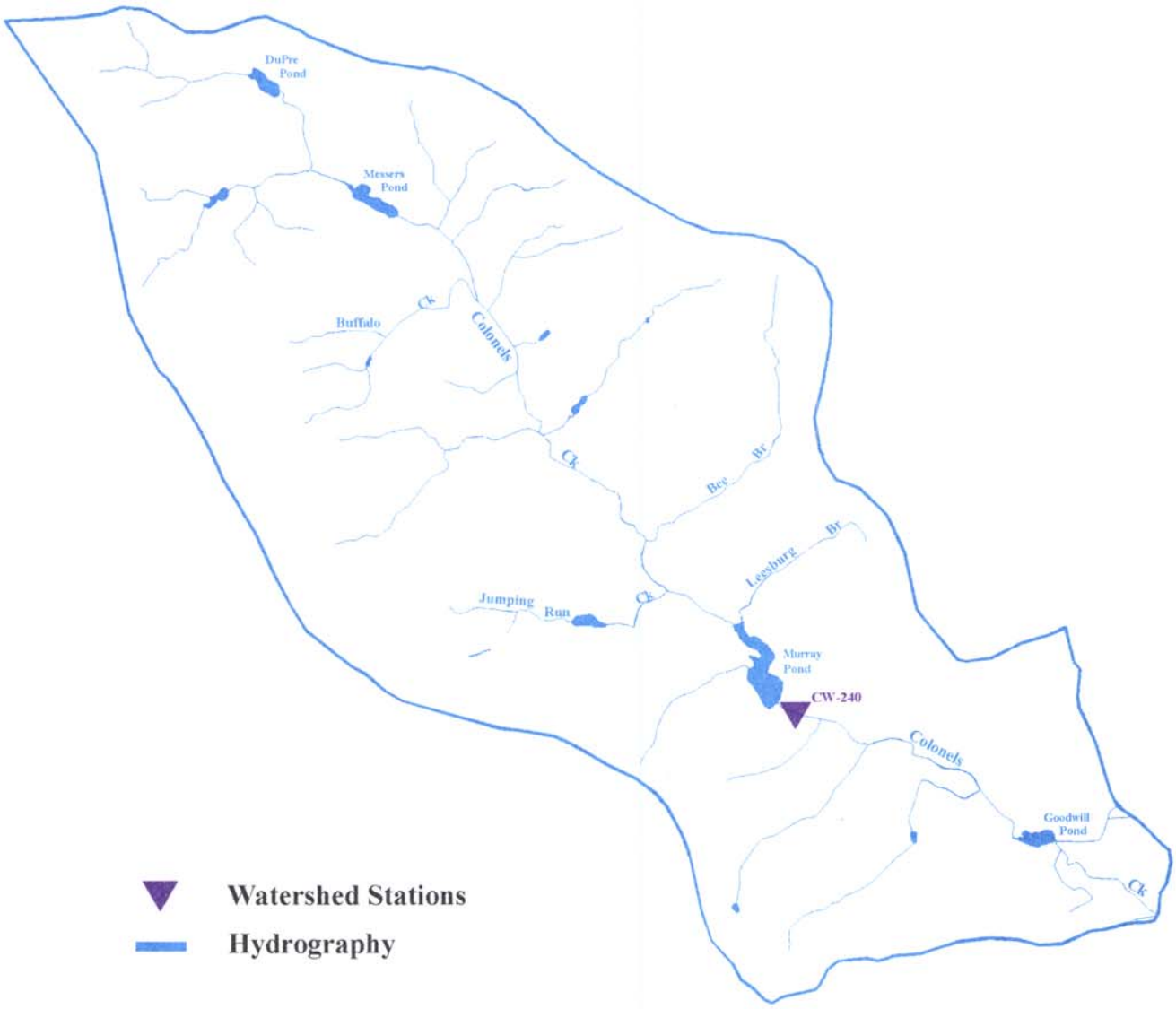


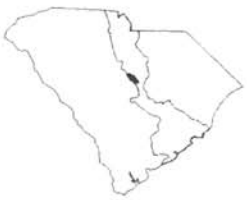
0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

Water Quality Monitoring Stations

Colonels Creek Watershed
(03050104-100)



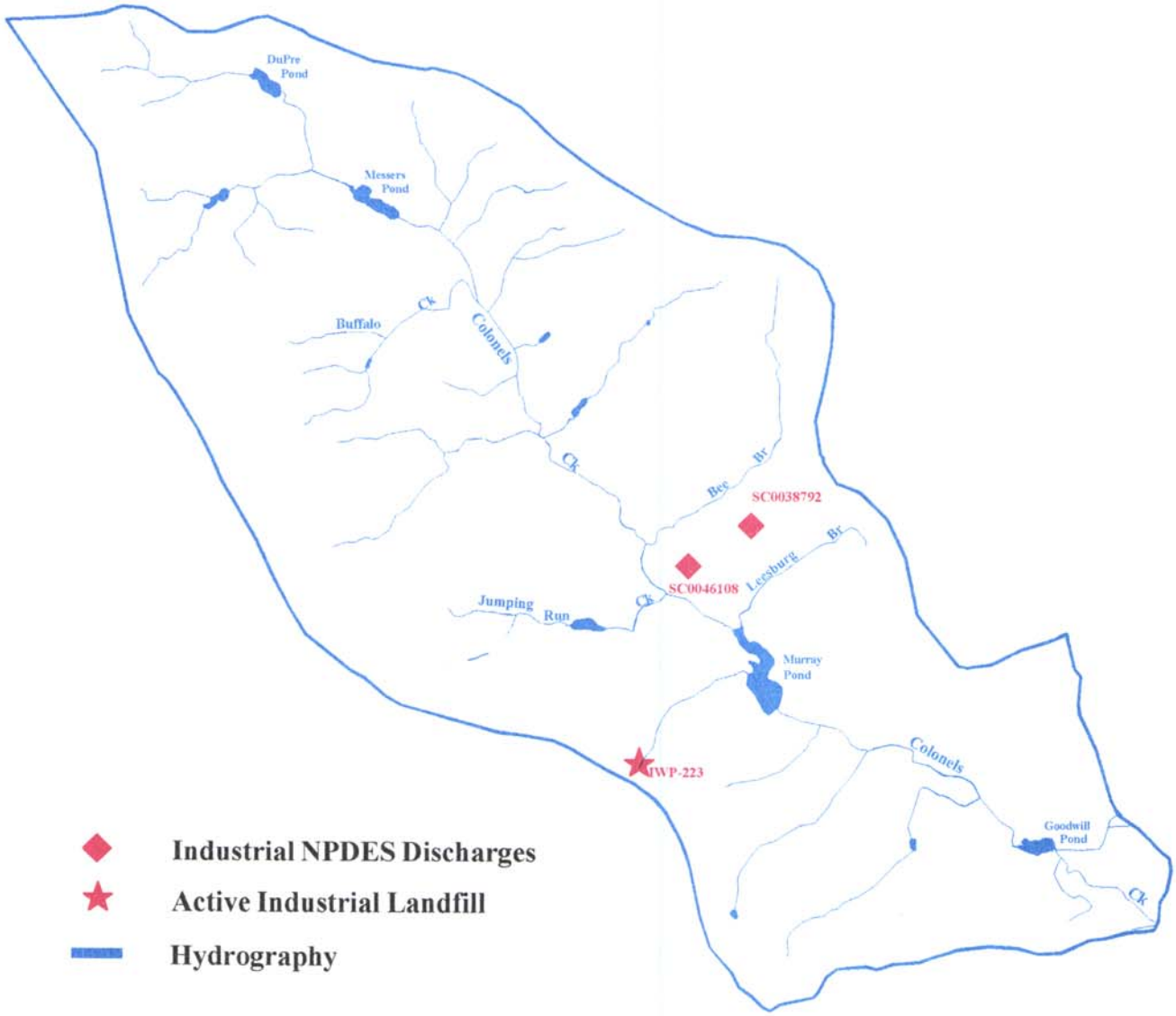


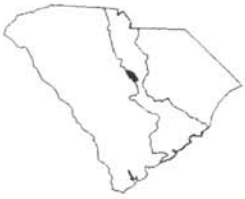
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Colonels Creek Watershed
(03050104-100)





N

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Watershed Evaluations and Implementation Strategies Within WMU-0302

Watershed Management Unit 0302 consists primarily of the ***Santee River Basin***, which originates in the Upper Coastal Plain region of the State, and flows through the Lower Coastal Plain and Coastal Zone regions. The Santee River Basin encompasses 11 watersheds, some 845,000 acres of which 0.5% is urban land, 12.0% is agricultural land, 12.3% is scrub/shrub land, 0.5% is barren land, 42.5% is forested land, 16.8% is forested wetland, 4.3% is nonforested wetland, and 11.1% is water (SCLRCC 1990). There are a total of 1506.1 stream miles and 55.3 square miles of estuaries.

The Santee River is formed from the confluence of the Congaree and Wateree Rivers and flows through Lake Marion. Also draining into Lake Marion are Halfway Swamp Creek, Jacks Creek, Tawcaw Creek, and Potato Creek. The Santee River is diverted in two directions in lower Lake Marion, flowing either out of the Santee Dam to eventually drain in the Atlantic Ocean, or channeling along a 7.5 mile diversion canal to fill Lake Moultrie (WMU-0303). After flowing through the Santee Dam, the Santee River is joined by the Rediversion Canal (through Mattassee Lake) connecting Lake Moultrie and the (lower) Santee River. Further downstream, the river splits into the South Santee River and the North Santee River, which both drain into the Atlantic Ocean. Wambaw Creek flows into the South Santee River and Wadmacon Creek drains into the North Santee River.

Fish Consumption Advisory

A fish consumption advisory has been issued by SCDHEC for Lake Marion, and the freshwater portions of the Santee River, advising people to limit the amount of some types of fish consumed from these waters and their tributaries due to mercury contamination. Pregnant women, infants, children, and people with neurologic diseases face the greatest risk of mercury related health problems and should not eat any fish from these waters. The fish consumption guidelines are based on diets of one type of fish only. If a person consumes several species listed for a stream, then the person should cut back even further on the amounts of each species consumed. For example, if a person eats 3.5 lbs. of largemouth bass from the Santee River, the person should not eat any bowfin from that river that month. The types of fish with mercury and the acceptable amounts of those fish that can be consumed are as follows: ***Upper Lake Marion*** - upstream of I-95 (Bowfin - 2 lb./month); ***Lower Lake Marion*** - downstream of I-95 (Largemouth bass - 3.75lb./month); ***Santee River*** (Bowfin - 2.25 lb./month, Catfish - 5.50 lb./month, Largemouth bass - 3.50lb./month).

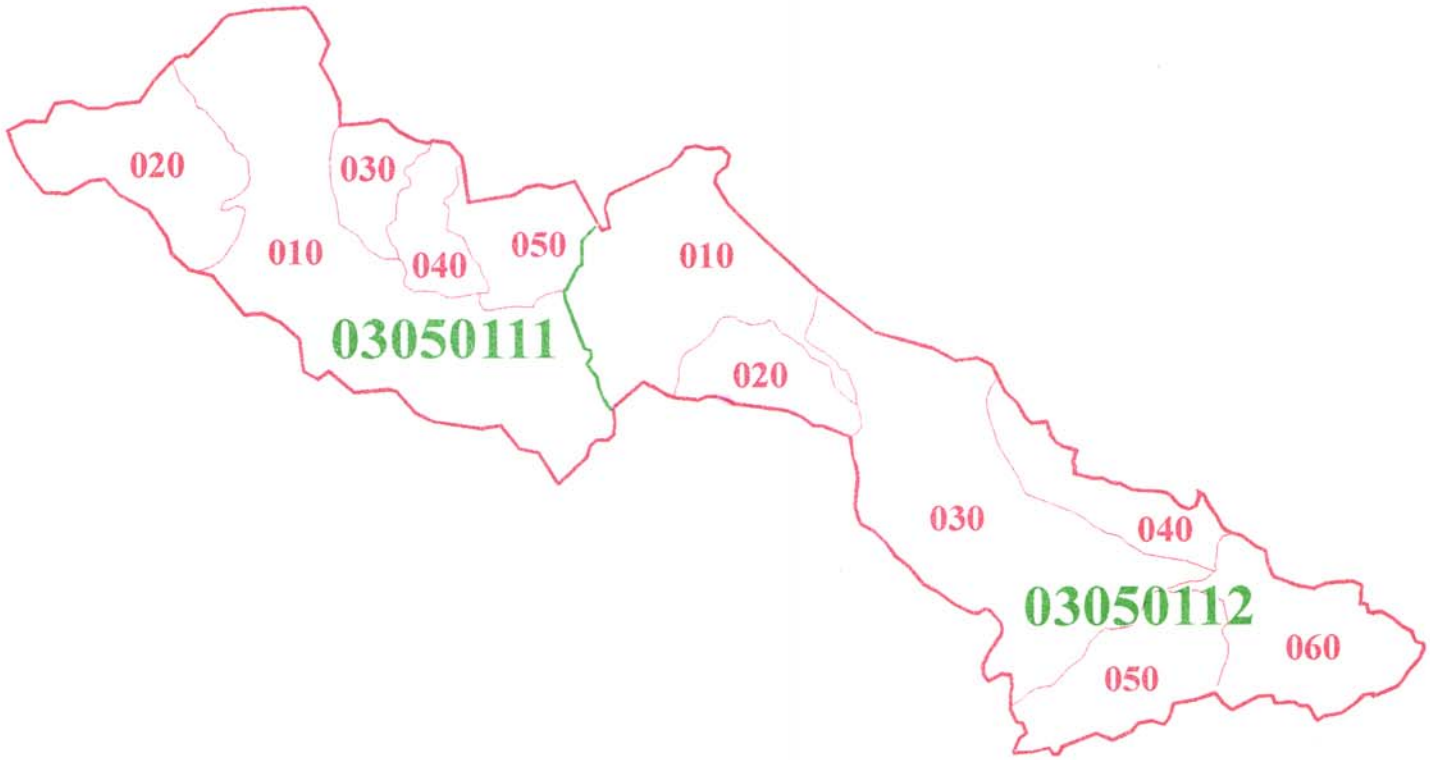
Mercury contamination in fish tissue is a rather recent phenomenon statewide, regionwide, nationwide, and worldwide. Scientific evidence suggests that mercury is being deposited on land and waterways from the atmosphere via rainfall. Sources of atmospheric mercury include the burning of coal, burning of medical and municipal wastes, lime manufacture, cloralkyli plants (makes chlorine and caustic soda), and cement kilns. Once the mercury is in freshwater, sulfur reducing bacteria convert it to methyl mercury which then is bioaccumulated in the food chain; ending up primarily in fish.

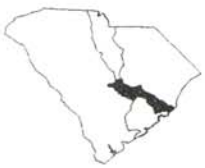
Climate

Normal yearly rainfall in the WMU-0302 area is 48.62 inches, according to the S.C. historic climatological record (SCWRC 1990). Data compiled from National Weather Service stations in Rimini, Georgetown, and at the Pinopolis Dam were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the summer with 17.24 inches; 9.98, 10.44, and 10.96 inches of rain falling in the fall, winter, and spring, respectively. The average annual daily temperature is 64.1°F. Summer temperatures average 79.2°F and fall, winter, and spring temperatures are 65.6°F, 47.8°F, and 63.7°F, respectively.

Watershed Unit Index Map

Watershed Management Unit 0302



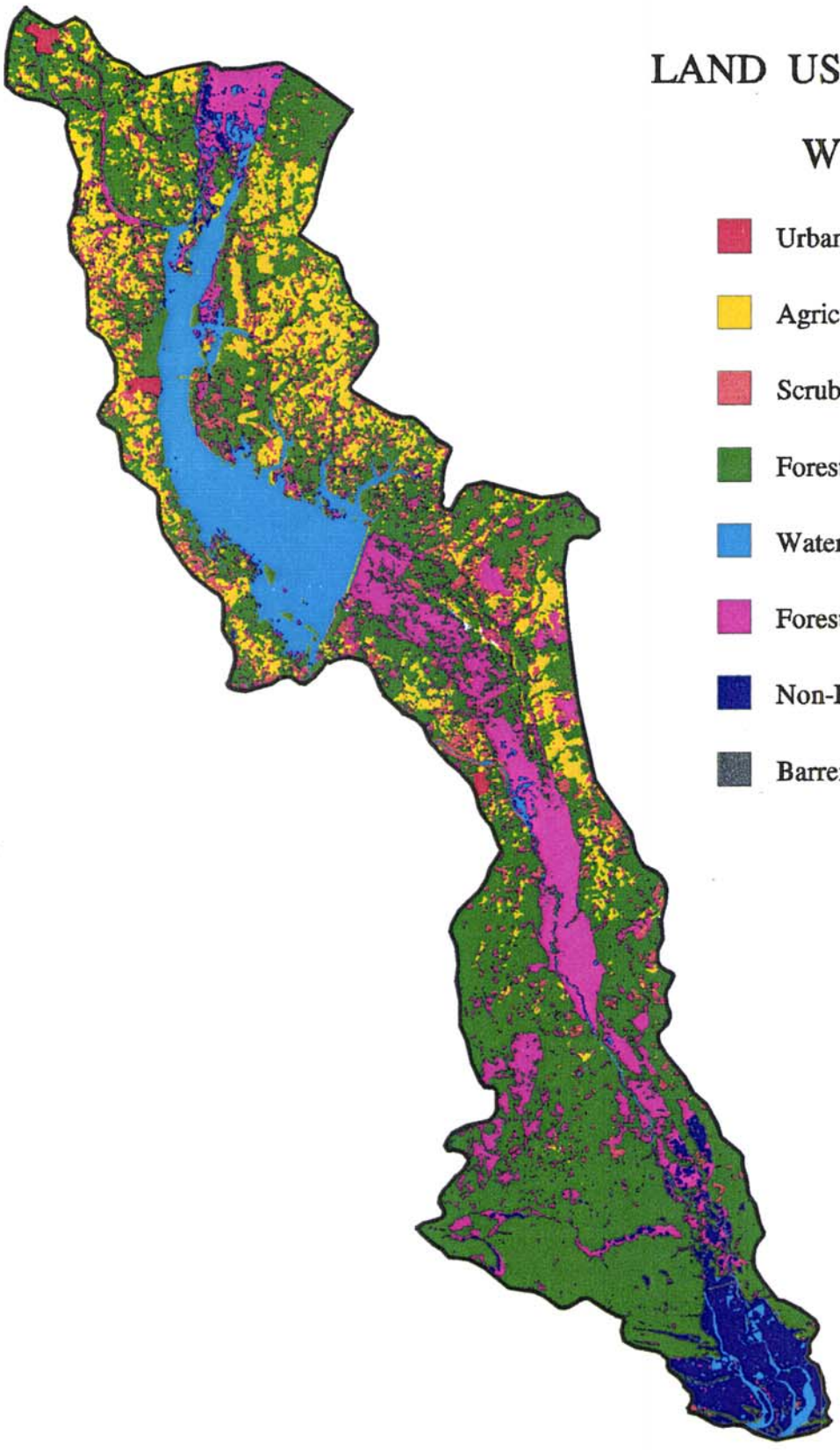


0 5 10 15 20 MILES

SCDHEC-EQC, 1995

LAND USE/LAND COVER

WMU-0302

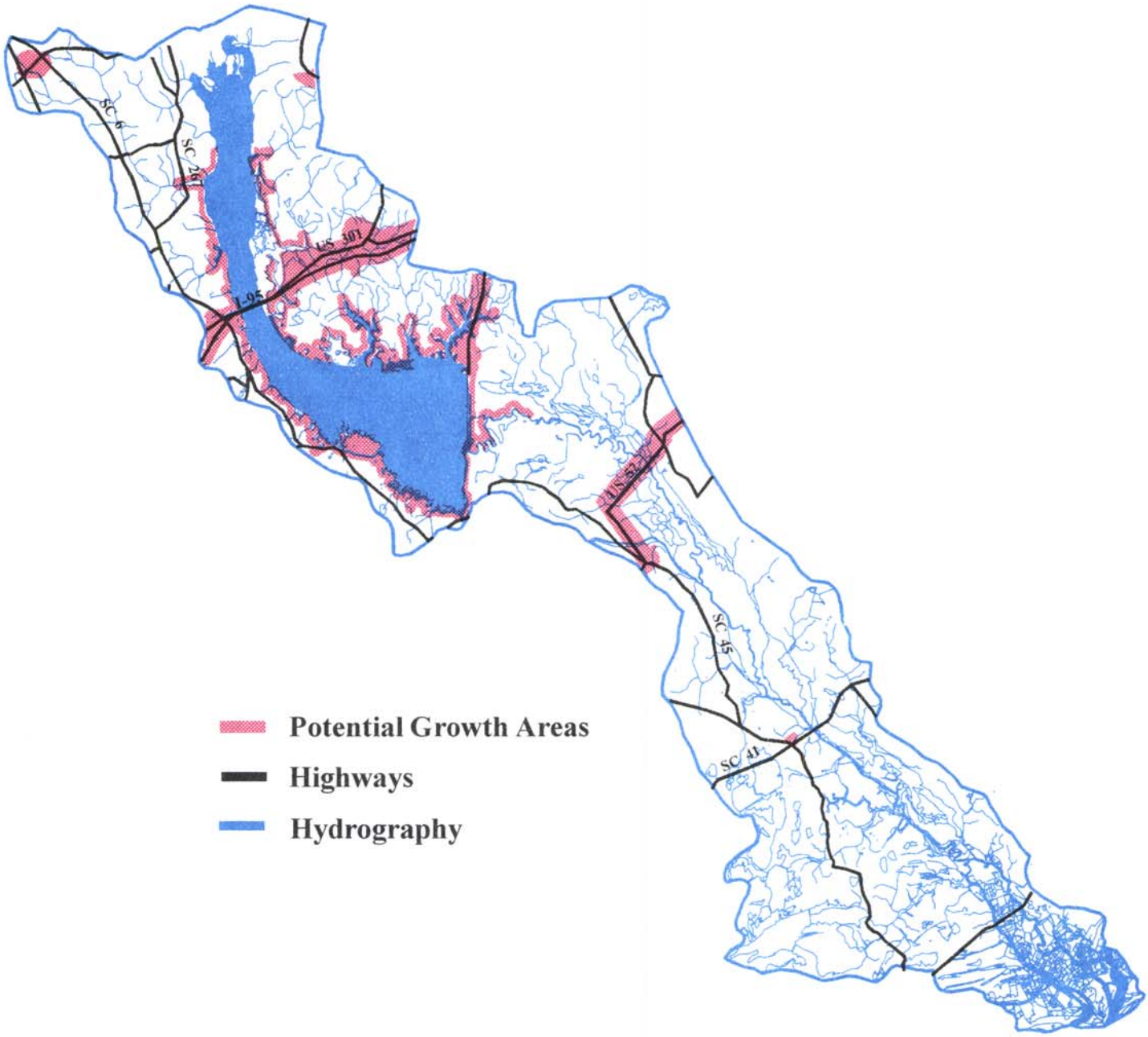


- Urban
- Agriculture
- Scrub/Shrub
- Forested
- Water
- Forested Wetlands
- Non-Forested Wetlands
- Barren/Disturbed

0 10 20 30 Miles

Source: Spot Satellite Imagery 89-90
SCDNR - LRC

Potential Growth Areas
Watershed Management Unit 0302



SCDHEC-EQC, 1995

0 5 10 15 20 MILES

03050111-010

(Santee River/Lake Marion)

General Description

Watershed 03050111-010 is located in Sumter, Clarendon, Calhoun, Orangeburg, and Berkley Counties and consists primarily of the ***Santee River*** and its tributaries that flow into Lake Marion. The watershed occupies 204,230 acres of the Upper and Lower Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Chastain-Cantey-Faceville-Goldsboro-Rains series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 2%, with a range of 0-6%. Land use/land cover in the watershed includes: 0.64% urban land, 14.34% agricultural land, 13.35% scrub/shrub land, 0.11% barren land, 24.42% forested land, 9.30% forested wetland, 0.59% nonforested wetland, and 37.24% water.

The Congaree River and the Wateree River join to form the headwaters of the Santee River. The Santee River flows through Lake Marion and exits through the Santee Dam or through the Diversion Canal to fill Lake Moultrie. Before entering the impounded Lake Marion, the Santee River receives drainage from Broadwater Creek, and the Santee Swamp receives drainage from Tavern Creek and Mill Creek. Streams draining into Lake Marion include Spring Grove Creek (Pine tree Creek, Ballard Creek, Half Way Creek, Duckford Branch), Richardson Branch, the Halfway Swamp Creek watershed (03050111-020), Little Poplar Creek, Big Poplar Creek, the Jacks Creek watershed (03050111-030), Cantey Bay (Oyster Bay, Monkey Bay), Chapel Branch, Webbs Creek, Mill Creek, Savana Branch, the Tawcaw Creek watershed (03050111-040), Eutaw Creek, and the Potato Creek watershed (03050111-050). Additional natural resources in the watershed include the Santee State Park near Big Poplar Creek and the Santee National Wildlife Refuge, which extends over the northern shoreline from Jacks Creek-Cantey Bay area to the Santee Dam. The Santee Cooper Public Service Authority oversees the operation of the lake with uses that include power generation and numerous forms of recreation (hunting, fishing, boating, swimming). There are a total of 73.6 stream miles and several recreational ponds in this watershed, all classified FW.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds within WMU-0302).

Santee River - The SCPSA has two sampling locations along this section of the Santee River. Aquatic life and recreational uses are fully supported at both locations.

Lake Marion - Categorized as a major lake, Lake Marion has a watershed encompassing 14,540.3 km^2 (up to the Lake Murray, Parr Reservoir, and Wateree Lake dams), a surface area of 44,759.2 hectares, and a maximum and mean depth of 23.4m and 3.9m, respectively. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrients were nitrogen

and phosphorus in both Halfway Swamp and Wyboo Creek arms of the lake. Due to the shallow depth and high nutrient level of this area of the lake, aquatic macrophytes have proliferated and public access has been restricted. Hydropower generation has been impaired by the plants as well as recreation. Treatment measures have included both aquatic herbicides and grass carp stocking by the Water Resources Division of SCNDR since 1989 to the present (excluding grass carp in 1993). Grass carp were introduced to the Packs Flat/Elliots Flat area of upper Lake Marion in 1989 at a rate of 25 fish/vegetated acre (100,000 fish). Grass carp were stocked in 1990 in the Low Falls (near Halfway Swamp) and Stumphole areas, in 1991 in the Jacks Creek and Stumphole areas, and in 1992 in the Stumphole, Jacks Creek, and Elliots Flat areas. All stockings were at a rate of 25 fish/vegetated acre and 100,000 fish at a time, for a total of 400,000 fish from 1989 to 1992. No fish were stocked in Lake Marion in 1993, but were introduced to Tawcaw Creek and Potato Creek in 1994, at a rate of 15 fish/vegetated acre for a total of 5,000 fish overall.

Several areas of the lake maintain impaired recreational usages. Boating usage of Halfway Swamp Creek is impaired due to submerged, emergent, and floating aquatic plants. Fishing in Halfway Swamp is impaired during the summer months due to low DO levels (<2.0). A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrients were nitrogen and phosphorus. Eutrophication studies classified Halfway Swamp Creek as Category I for excessive nutrients with extremely high productivity and further study is recommended. Eutrophication studies classified the upper lake area as Category I, the midlake area as Category II, and the dam area as Category III.

There are fourteen S.C. Public Service Authority (SCPSA) monitoring sites within the main body of Lake Marion, and aquatic life and recreational uses are fully supported at these sites. Although there were dissolved oxygen excursions in the upper end of the lake, they were typical of conditions in swamp drainage and were considered natural, not standards violations. At station ST-025, near the old U.S. 301 and U.S. 15 bridge, significantly decreasing trends in five-day biochemical oxygen demand and total nitrogen concentrations suggest improving conditions. A significantly decreasing trend in pH was also detected. A high concentration of copper was measured in water in 1989, and chromium was elevated in a 1992 water sample.

Stream from new sedimentation pond at GSX - This site is sampled by the SCPSA. Aquatic life uses are not supported due to pH excursions. Recreational uses are fully supported.

Stream from old sedimentation pond at GSX - This site is sampled by the SCPSA. Aquatic life and recreational uses are fully supported.

Stream from Touchberry Pond off GSX site - This site is sampled by the SCPSA. Aquatic life and recreational uses are fully supported.

Broadwater Creek - This site was sampled by the SCPSA in 1989. Aquatic life and recreational uses were fully supported. Although there were dissolved oxygen excursions, they were typical of values seen in swamp drainages and were considered natural, not standards violations.

Tavern Creek - This is a SCDHEC macroinvertebrate sampling site. Aquatic life uses are fully supported based on macroinvertebrate community data.

Spring Grove Creek - This site is sampled by the SCPSA. Aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

Big Poplar Creek - This site is sampled by the SCPSA. Aquatic life uses are not supported due to dissolved oxygen excursions. Recreational uses are fully supported.

Unnamed stream from pond on Santee National Golf Course - This site is sampled by the SCPSA. Aquatic life and recreational uses are fully supported.

Headwaters of Chapel Branch - This site is sampled by the SCPSA. Aquatic life uses are fully supported. Excursions of pH occurred; however, higher levels occur naturally in lakes with significant phytoplankton communities and are considered to be natural, not standards violations. Recreational uses are fully supported.

Diversion Canal - Aquatic life uses may be only partially supported due to high concentrations of copper and zinc measured in water by SCDHEC, compounded by a significantly declining trend in dissolved oxygen. A significantly decreasing trend in pH was also noted. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, total nitrogen, and turbidity suggest improving conditions. The pesticides P,P'DDT, methoxychlor, and hexachlorobenzene were detected in the 1991 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully supported.

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
MILL CREEK MAC BOYKIN DAY CAMP	43-N04 ACTIVE
BIG POPLAR CREEK CAMP DANIELS	NO PERMIT ACTIVE
LAKE MARION SANTEE STATE PARK	NO PERMIT ACTIVE

LAKE MARION
ROCKS POND CAMPGROUND

NO PERMIT
ACTIVE

LAKE MARION
SPIERS LANDING

08-N05
ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM
FACILITY NAME
PERMITTED FLOW @ PIPE (MGD)
COMMENT

NPDES#
TYPE
LIMITATION (EL/WQL)

LAKE MARION TRIB
MARTIN MARIETTA
PIPE #: 001 FLOW: M/R
GROUNDWATER AND STORMWATER

SC0002976
MINOR INDUSTRIAL
EFFLUENT

LAKE MARION
LAIDLAW ENVIR. SERVICES
PIPE #: 001 FLOW: 1.26
PIPE #: 002 FLOW: 0.61
PIPE #: 002A FLOW: 1.37

SC0042170
MINOR INDUSTRIAL
EFFLUENT

LAKE MARION
TOWN OF PINEWOOD
PIPE #: 001 FLOW: M/R

SC0046868
MINOR MUNICIPAL
EFFLUENT

PINE TREE CREEK
TOWN OF PINEWOOD WWTP
PIPE #: 001 FLOW: 0.06
WQL FOR NH3-N, TRC

SC0039632
MINOR MUNICIPAL
WATER QUALITY

PINE TREE CREEK
TOWN OF PINEWOOD WWTP
PIPE #: 001 FLOW: 0.134
PROPOSED; WQL FOR NH3-N, TRC

SC0046868
MINOR MUNICIPAL
WATER QUALITY

LAND APPLICATION SYSTEM
FACILITY NAME

ND#
TYPE

SPRAYFIELD
TOWN OF ELLOREE

ND0067628
MINOR MUNICIPAL

SPRAY ON GOLF COURSE
LAKE MARION RES. & MARINA

ND0067610
MINOR COMMUNITY

SPRAY ON GOLF COURSE
SANTEE PSD

ND0065676
MINOR MUNICIPAL

SPRAYFIELD
SANTEE RESORT HOTEL

ND0067652
MINOR COMMUNITY

SPRAYFIELD SANTEE LAKES CAMPGROUND	ND0067326 MINOR COMMUNITY
SPRAYFIELD GOAT ISLAND RESORT	ND0067318 MINOR COMMUNITY
SPRAYFIELD SCDPRT/SANTEE ST PK COTTAGES	ND0067920 MINOR COMMUNITY

Nonpoint Source Contributions

Lake Marion is included on the §319 list of waters, and has an implementation action addressing nonpoint source pollution concerns in progress (see watershed project below). Lake Marion is also included on the §304(l) long list of waters impacted by nontoxic pollutants.

Lake Marion Watershed Project

The Lake Marion Watershed Project involves inventory, assessment, inspection, and permitting of agricultural animal waste facilities in the Lake Marion-Lower Wateree drainage in Sumter and Clarendon Counties. The project is in cooperation with the USDA Soil Conservation Service (SCS). Bacterial contamination and high nutrient concentrations in some waterbodies in this watershed were found to be contributed by animal waste. A total of 64 confined animal operations were inspected, and more than 80% were found to be in non-compliance. The DHEC Agricultural Waste specialist, Department District personnel, and SCS staff are working with land owners to correct deficiencies in existing agricultural waste treatment facilities or construct new agricultural waste treatment facilities. As of July, 1995, only 20% of the facilities were in non-compliance.

Landfill Activities

There is one closed municipal landfill in this watershed.

LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
LAIDLAW ENVIR. SERVICES HAZARDOUS WASTE	SCDO70375985 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
LAIDLAW ENVIR. SERVICES MINGO MINE #1	0416-43 FULLERS EARTH
LAIDLAW ENVIR. SERVICES MINGO MINE #4	0712-14 CLAY
SANTEE ROCK PRODUCTS, INC. ST. PAUL MINE	0793-14 SAND/GRAVEL

Growth Potential

There is a high potential for continued growth in this watershed due primarily to Lake Marion related factors: fishery tourism, new lakeside subdivisions, marinas, landings, and camping facilities. There is also a high potential for residential, commercial, and industrial growth around the interchanges of I-95 at the Town of Santee and with U.S 301 and U.S. 15. There is a moderate potential for growth around the Town of Pinewood, where the hazardous waste landfill is located.

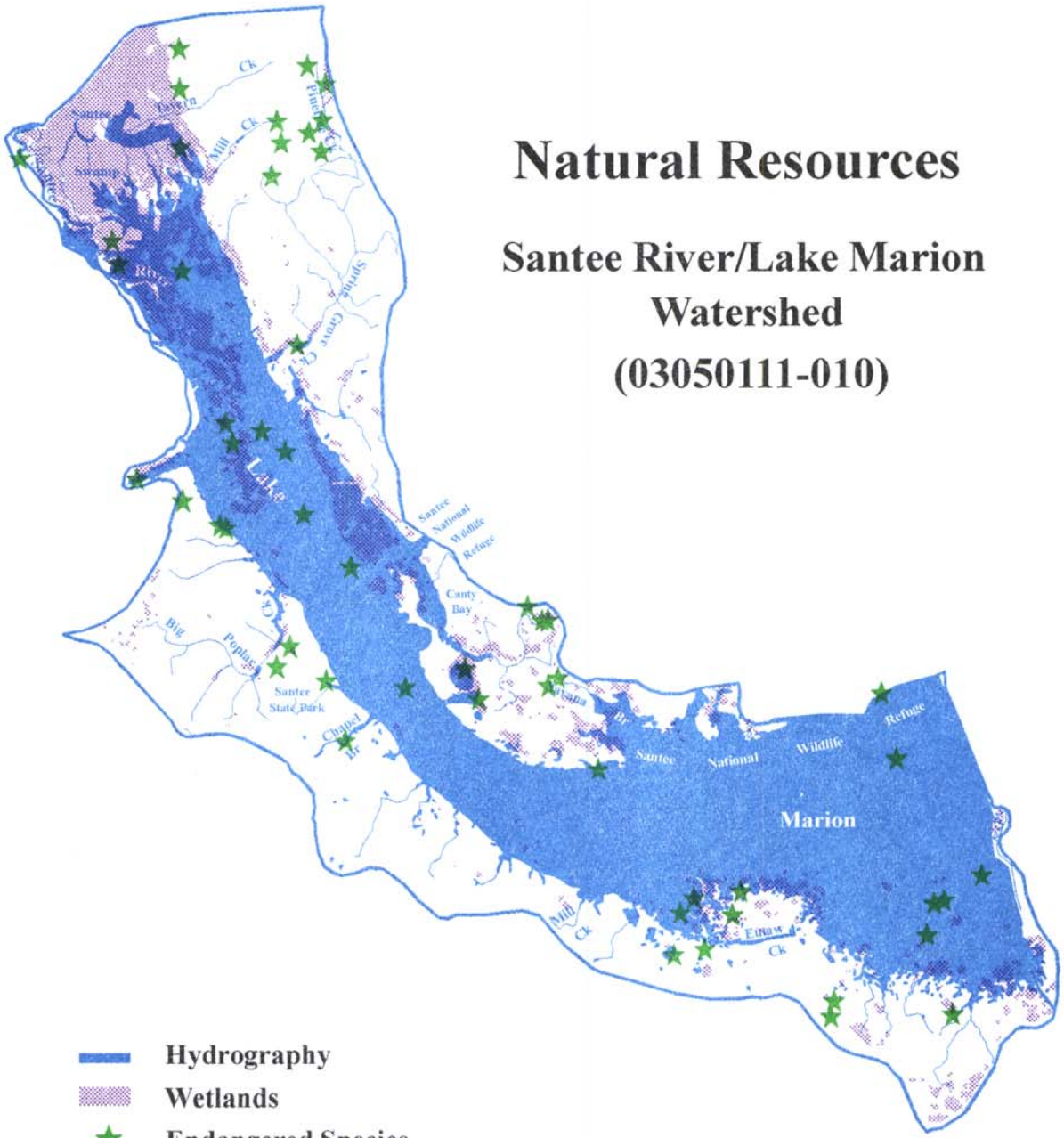
Implementation Strategy

Aquatic life uses for Big Poplar Creek are impaired by low dissolved oxygen concentrations and the stream draining the new sedimentation pond at GSX is impaired by low pH, all due to unknown sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. Recreational uses are impaired for Spring Grove Creek due to elevated fecal coliform concentrations due to nonpoint sources. A special study to evaluate the situation is ongoing. Lake Marion has an increasing trend in pH due to unknown sources; an evaluation of this situation is ongoing. Aquatic life uses are also impaired for the Diversion Canal by elevated zinc and copper concentrations from unknown sources; an evaluation of the situation is ongoing.

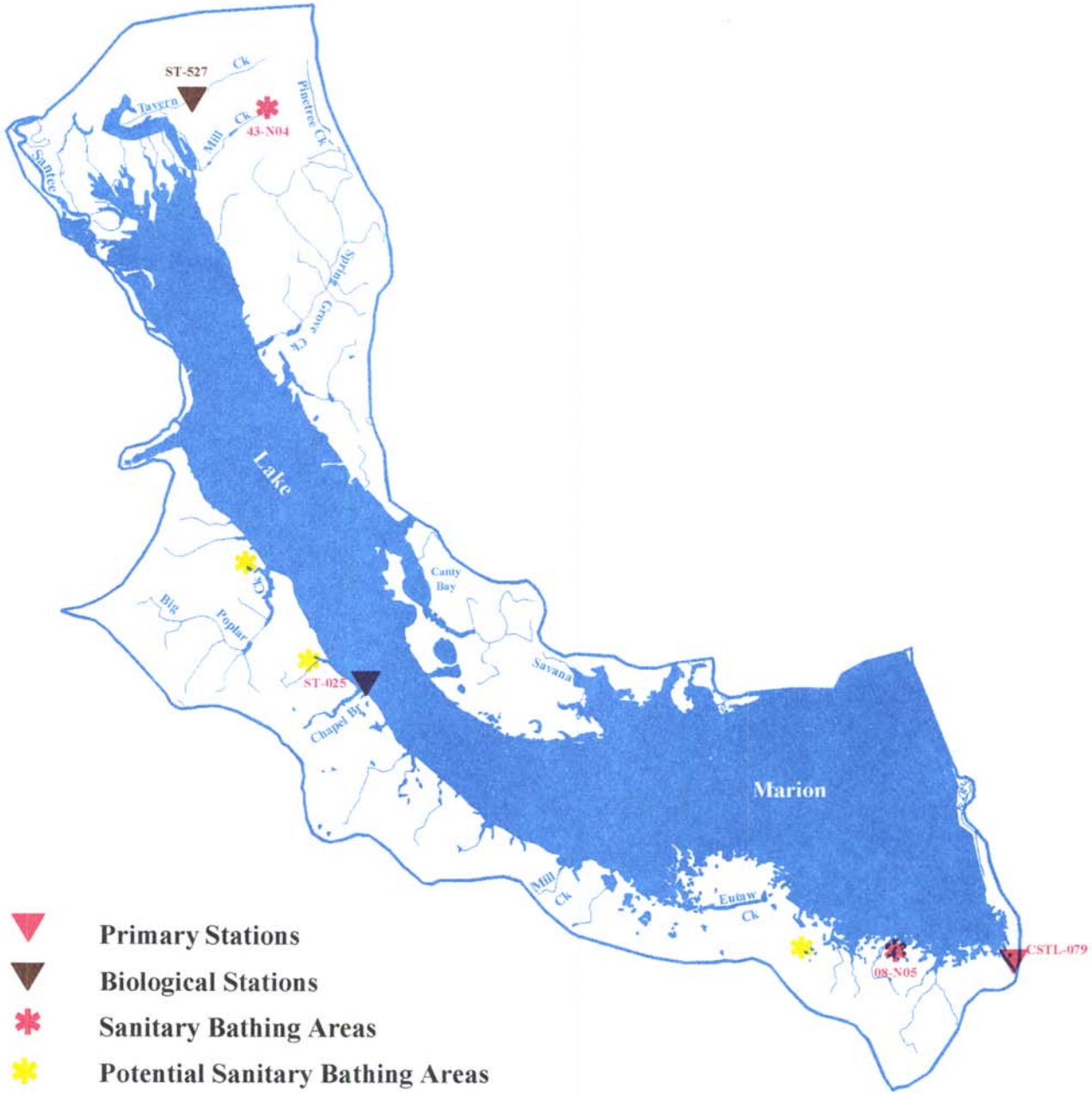
The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Santee River/Lake Marion Watershed (03050111-010)



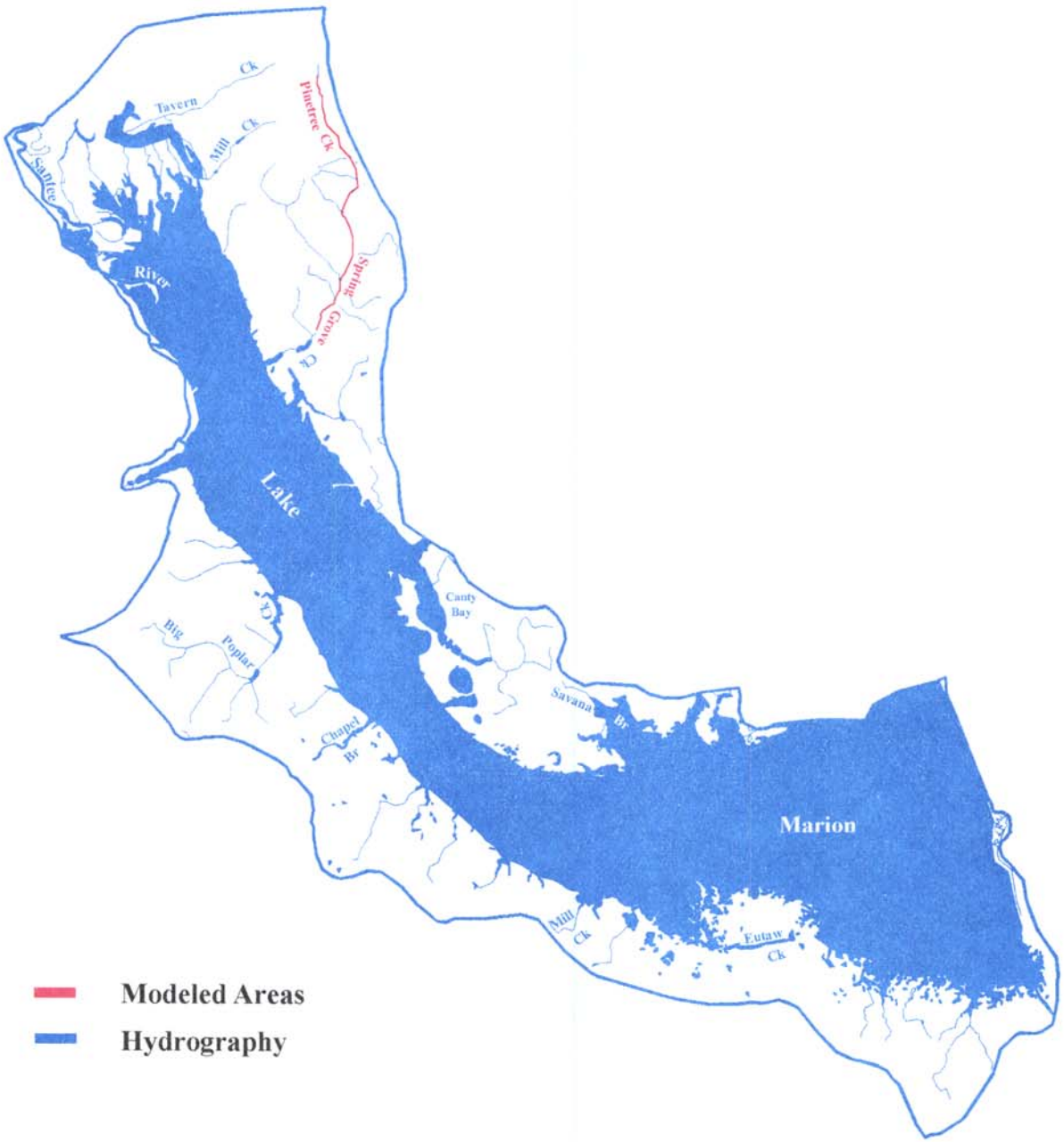
Water Quality Monitoring Stations
Santee River/Lake Marion Watershed
(03050111-010)

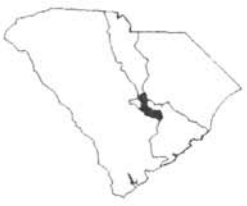


SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Santee River/Lake Marion Watershed
(03050111-010)





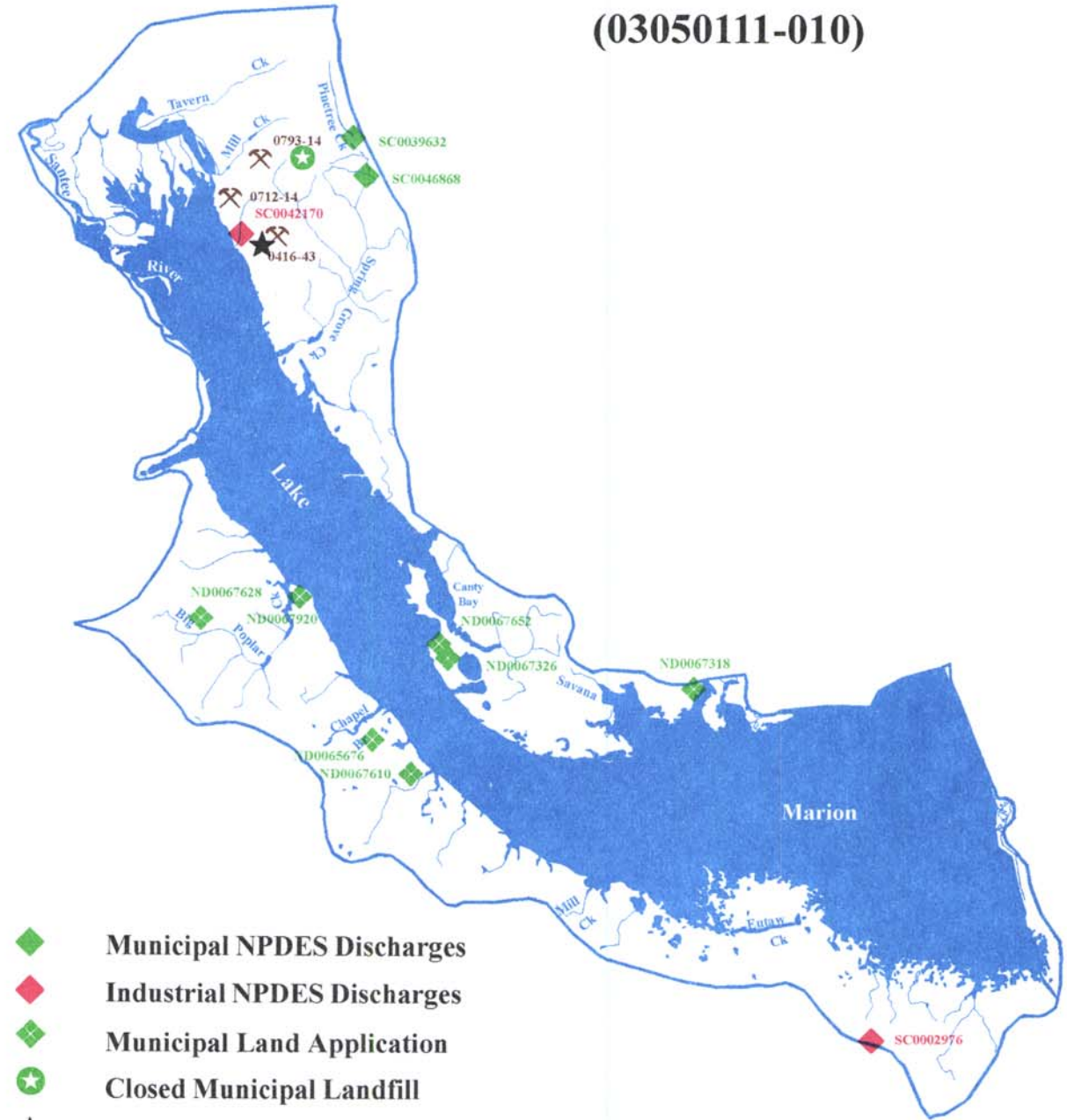
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Santee River/Lake Marion Watershed

(03050111-010)



03050111-020

(Halfway Swamp Creek)

General Description

Watershed 03050111-020 is located in Calhoun County and consists primarily of ***Halfway Swamp Creek*** and its tributaries. The watershed occupies 70,472 acres of the Upper Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Wagram-Faceville-Marlboro-Noboco series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 2%, with a range of 0-6%. Land use/land cover in the watershed includes: 2.40% urban land, 26.96% agricultural land, 8.90% scrub/shrub land, 1.68% barren land, 46.09% forested land, 11.56% forested wetland, 0.08% nonforested wetland, and 2.33% water.

Halfway Swamp Creek originates near the Town of St. Matthews and drains into the upper reaches of Lake Marion. Before entering Lake Marion, Halfway Swamp Creek receives drainage from Lake Inspiration (35 acres) located in downtown St. Matthews, Furlick Branch, Lyons Creek (Antley Springs Branch, Bell Branch), and Hutto Pond (40 acres). Also draining into Lake Marion upstream of Halfway Swamp Creek are Squirrel Creek and Warley Creek. There are several small lakes and ponds in this watershed and a total of 84.2 stream miles, all classified FW.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Halfway Swamp Creek - There are two SCDHEC and one SCPSA monitoring sites along Halfway Swamp Creek. Aquatic life uses are fully supported at the upstream site, but may be threatened by a increasing trend in turbidity. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. Recreational uses are not supported at this site due to fecal coliform bacteria excursions, but a decreasing trend in fecal coliform bacteria concentration suggests improving conditions. Aquatic life uses are fully supported at the downstream site, sampled by SCPSA, but recreational uses are only partially supported due to fecal coliform bacteria excursions.

Halfway Swamp Creek Tributary- Aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Inspiration - Aquatic life uses are only partially supported due to dissolved oxygen and pH excursions, compounded by decreasing trends in dissolved oxygen and pH. This lake was drained, dredged, and refilled during the period under review, which may account for many of these excursions. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Warley Creek - This site is sampled by the SCPSA, and aquatic life and recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Point Source Contributions

Halfway Swamp Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to fecal coliform, turbidity, and nutrient concerns. The Halfway Swamp Creek arm of Lake Marion is included on the §303(d) low priority list for nutrient concerns.

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
ANTLEY SPRINGS	SC0028801
TOWN OF ST MATTHEWS/SOUTH PLANT	MINOR MUNICIPAL
PIPE #: 001 FLOW: 0.55	WATER QUALITY
WQL FOR NH3-N, TRC, DO	

Nonpoint Source Contributions

Halfway Swamp Creek is included on the §319 list of waters targeted for implementation action related to agricultural activities and urban runoff. Water samples collected by the Department indicate elevated fecal coliform and nutrient levels on numerous occasions, and scattered elevated levels of turbidity. Halfway Swamp Creek is also included on the §304(l) long list of impacted waterbodies due to concerns for nontoxic pollutants.

Mining Activities

MINING COMPANY	*PERMIT #*
MINE NAME	*MINERAL*
DORCHESTER DIRT PIT, INC.	0832-09
DIAMOND MINE #2	CLAY

Growth Potential

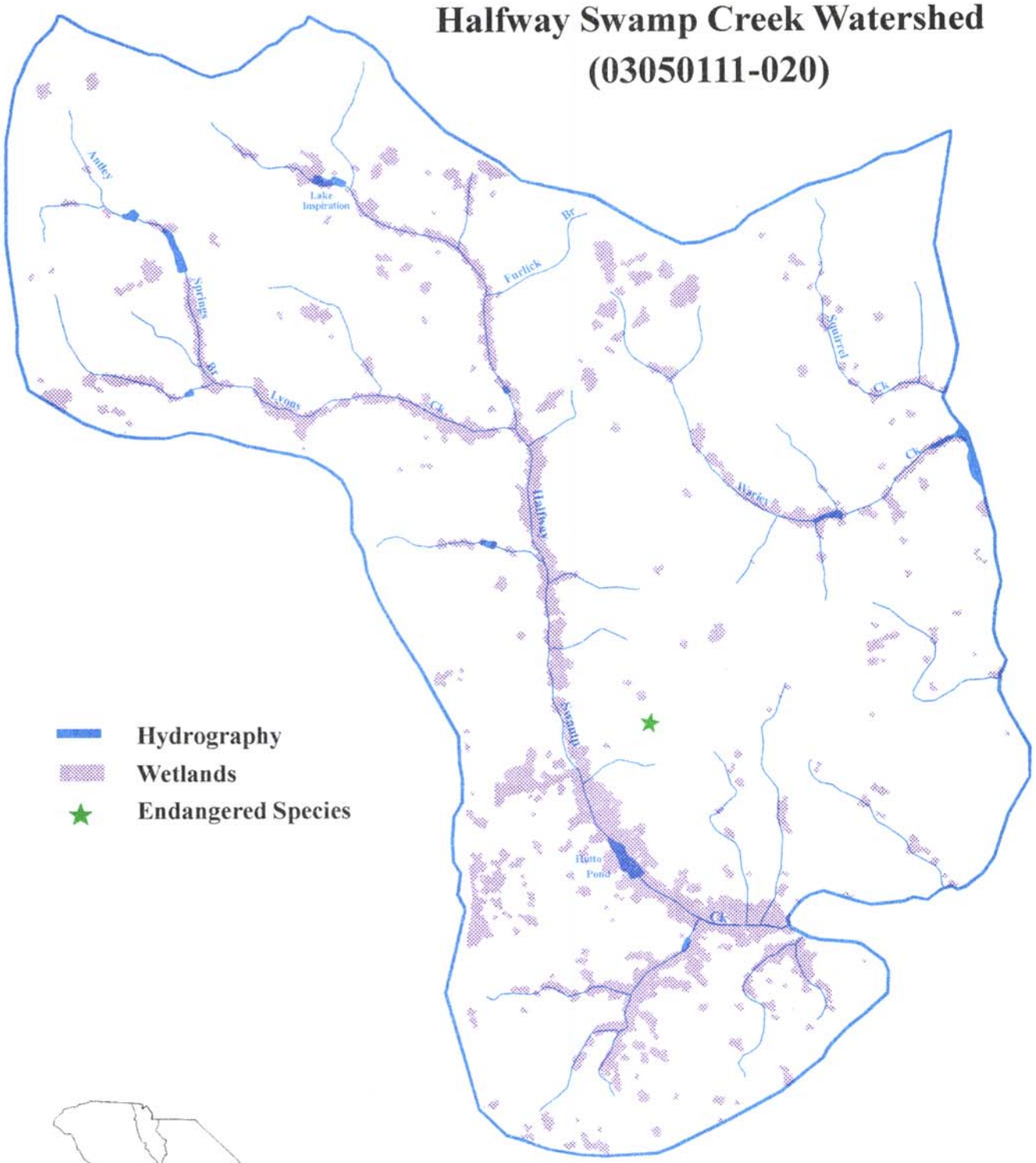
There is a low potential for growth in this watershed, with the exception of the northwestern corner around the Town of St. Matthews.

Implementation Strategy

Recreational uses for Halfway Swamp Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. Both aquatic life and recreational uses are impaired for Lake Inspiration due to low dissolved oxygen and elevated fecal coliform bacteria concentrations due to dredge and fill operations. An evaluation of the situation is ongoing. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

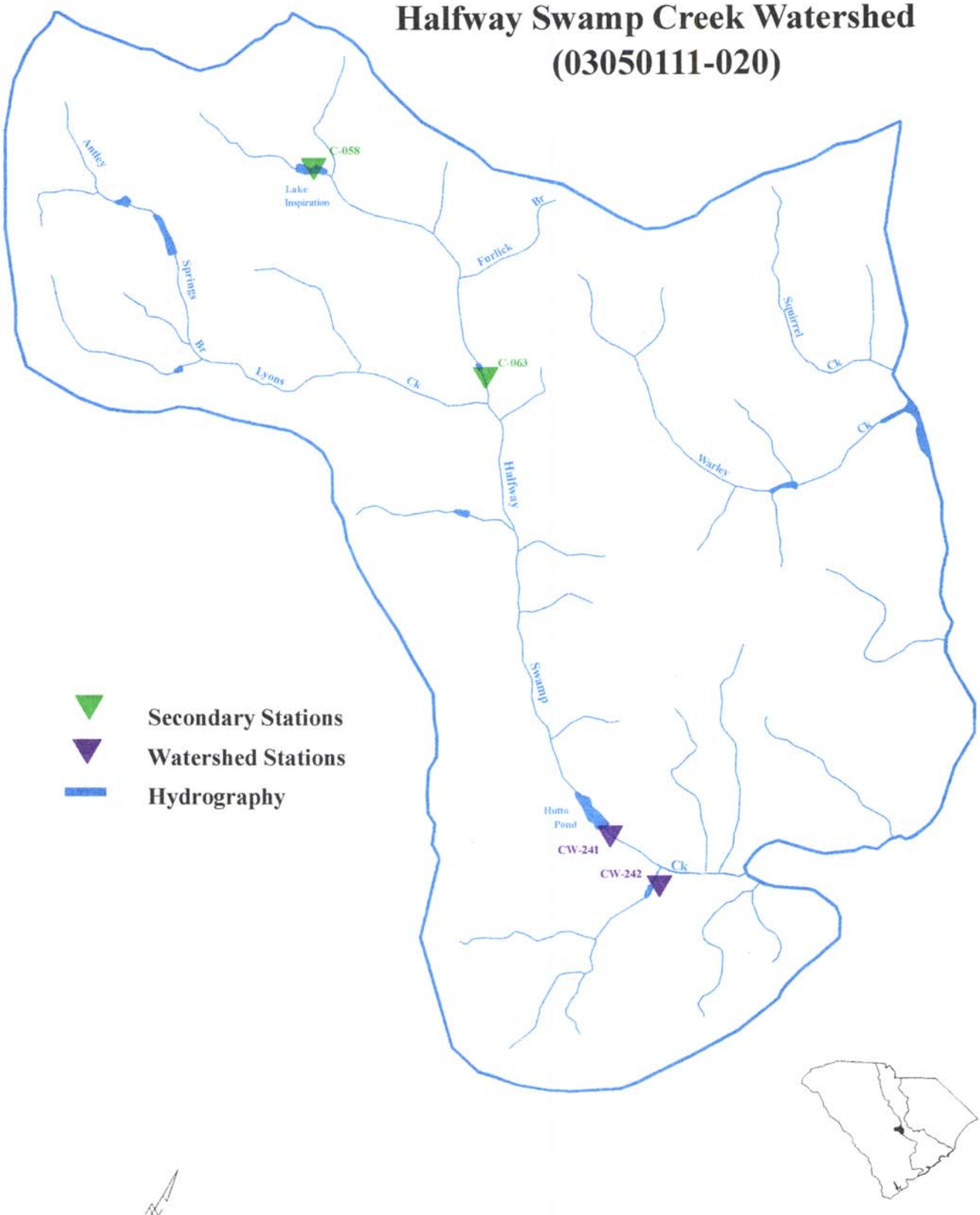
Halfway Swamp Creek Watershed
(03050111-020)



SCDHEC-EQC, 1995

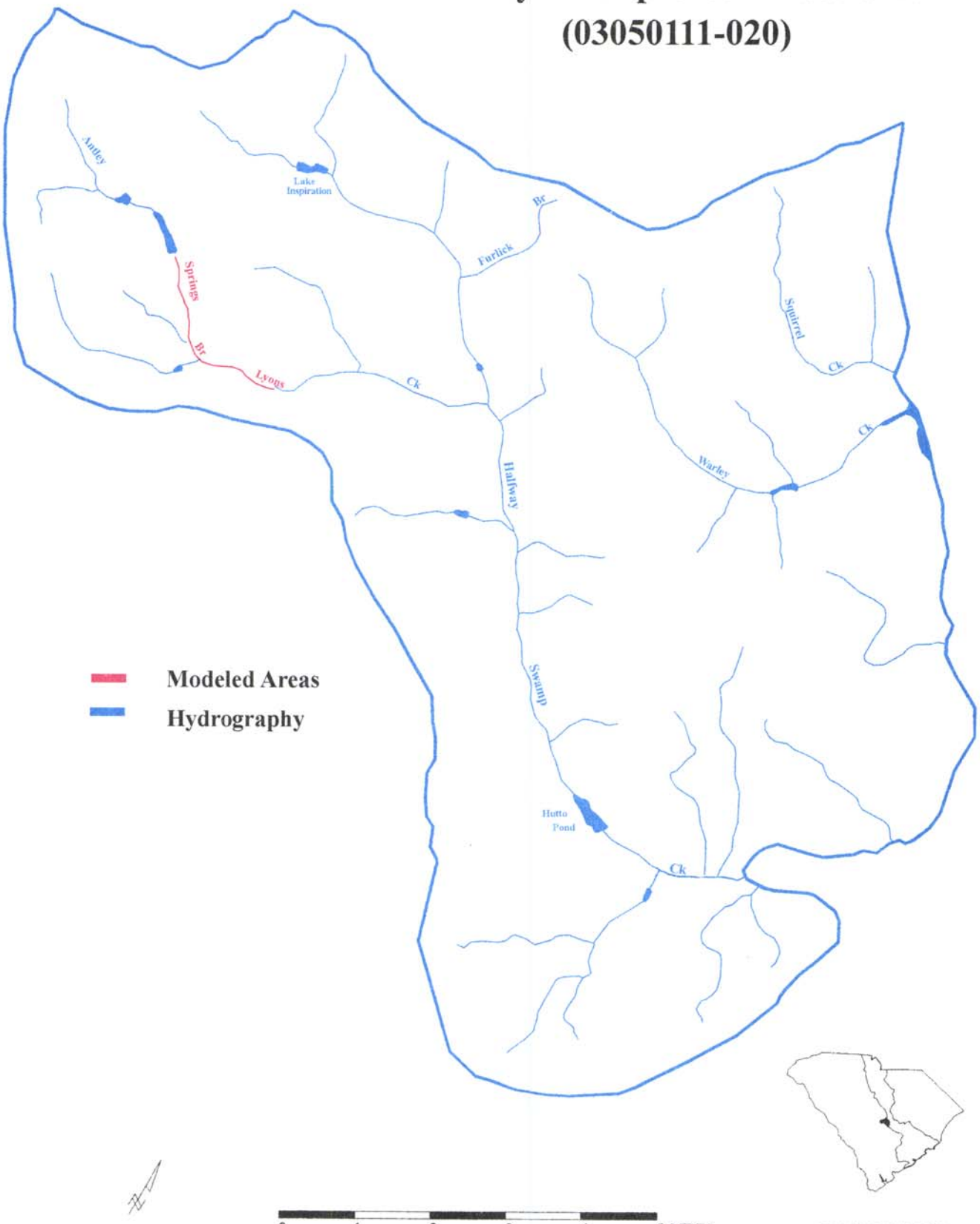
Water Quality Monitoring Stations

Halfway Swamp Creek Watershed (03050111-020)



Streams Modeled for Wasteload Allocation

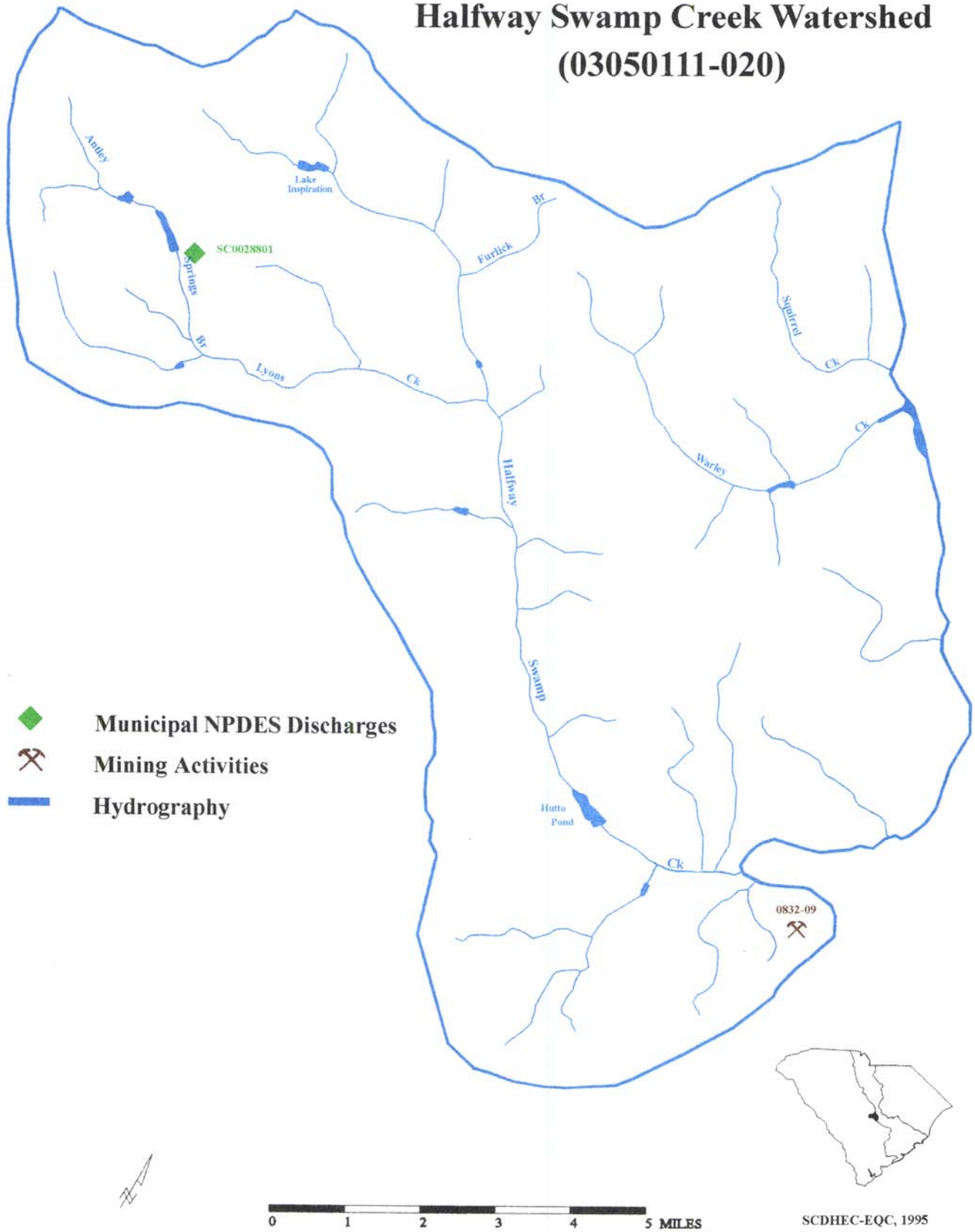
Halfway Swamp Creek Watershed (03050111-020)



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Halfway Swamp Creek Watershed (03050111-020)



03050111-030

(Jacks Creek)

General Description

Watershed 03050111-030 is located in Clarendon County and consists primarily of ***Jacks Creek*** and its tributaries. The watershed occupies 29,184 acres of the Upper Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Faceville-Marlboro-Noboco-Bonneau-Cantey series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 5%, with a range of 0-10%. Land use/land cover in the watershed includes: 0.05% urban land, 43.63% agricultural land, 22.00% scrub/shrub land, 31.14% forested land, 2.17% forested wetland, 0.04% nonforested wetland, and 0.97% water.

Jacks Creek accepts drainage from Belser Creek (Chapel Creek), Sullivans Branch, and Big Branch (Spring Branch) before flowing into Lake Marion. There are a few recreational ponds (25-30 acres) in this watershed and a total of 49.1 stream miles, all classified FW. The Santee National Wildlife Refuge is an additional natural resource in the watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Jacks Creek - The Jacks Creek station is sampled by both SCDHEC and SCPSA. Aquatic life uses are fully supported, but may be threatened by an elevated concentration of chromium in 1993. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Jacks Creek Arm of Lake Marion - Aquatic macrophytes have proliferated and public access has been restricted in Jacks Creek due to the shallow depth and high nutrient levels. Jacks Creek was treated with herbicide and stocked with grass carp by the Water Resources Division of the SCDNR in 1991 and in 1992. All stockings were at a rate of 25 fish/vegetated acre for a total of 100,000 fish.

Big Branch - Aquatic life uses are fully supported. Although pH excursions occurred, these were typical of values seen in blackwater systems and were considered natural, not standards violations. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Nonpoint Source Contributions

Big Branch is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen and fecal coliform concerns.

Mining Activities

MINING COMPANY / *MINE NAME*	*PERMIT #* / *MINERAL*
CLARENDON SAND & GRAVEL, INC. / STUKES MINE	0990-14 / SAND/CLAY

Growth Potential

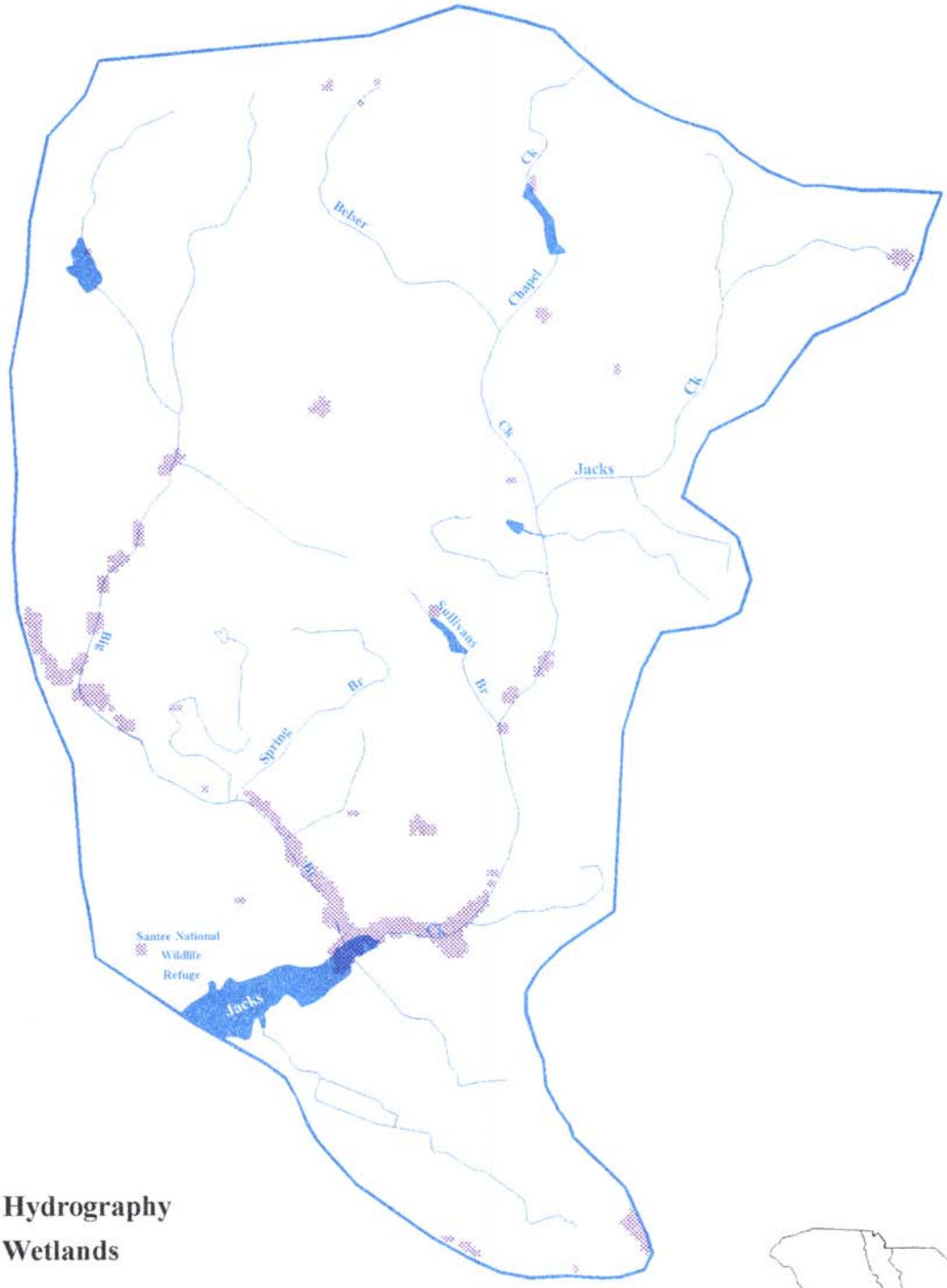
There is low to moderate potential for growth in this watershed. There is a small portion of lakeshore, but the lack of water or sewer services in the watershed will limit significant growth.

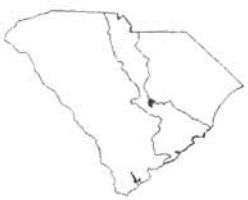
Implementation Strategy

Recreational uses for Jacks Creek and Big Branch are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Jacks Creek Watershed
(03050111-030)



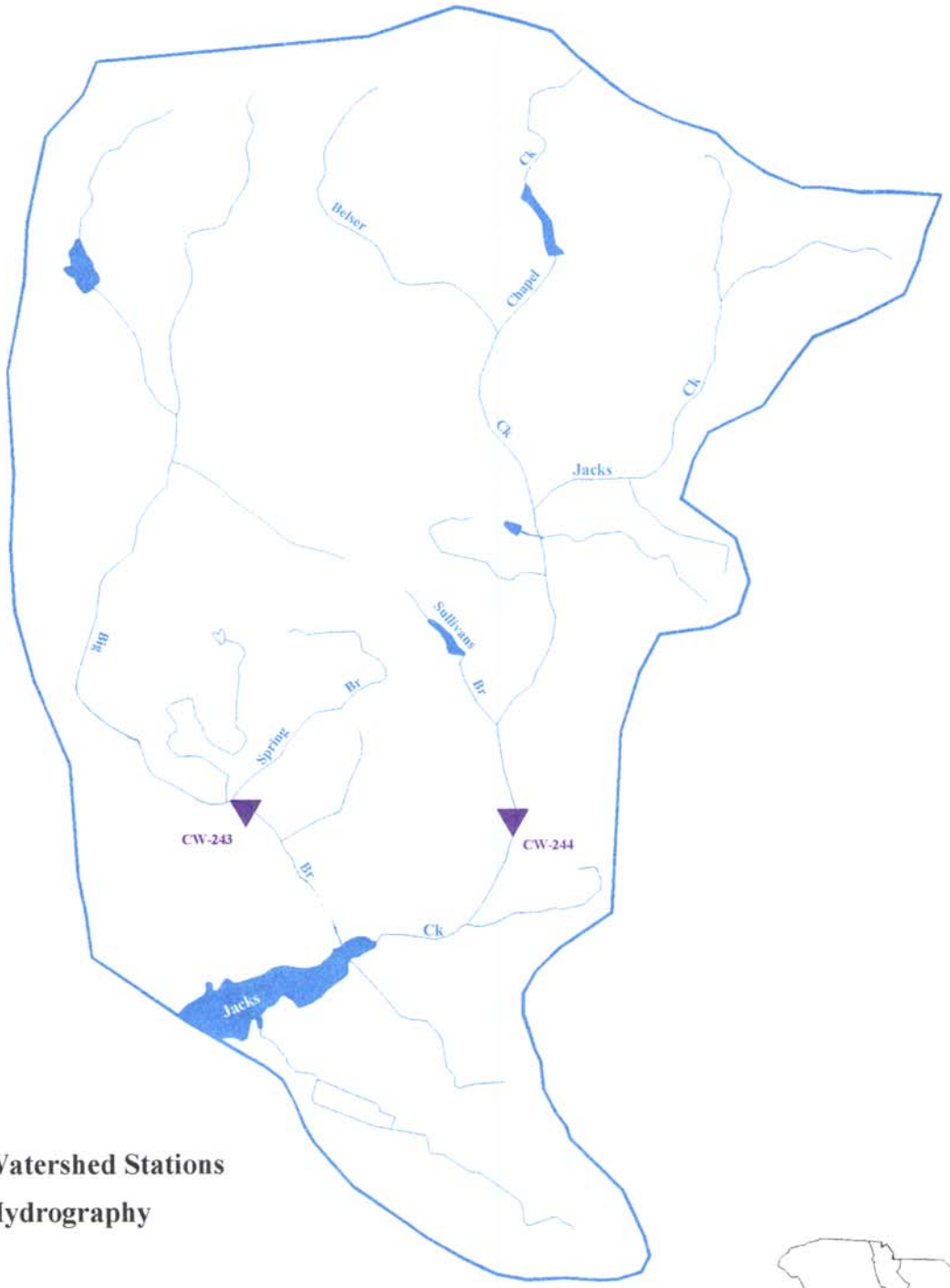


0 1 2 3 4 5 MILES

MILES SCDHEC-BQC, 1995

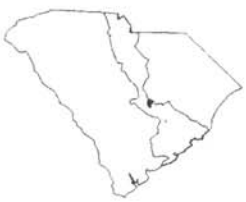
Water Quality Monitoring Stations

Jacks Creek Watershed
(03050111-030)



Watershed Stations

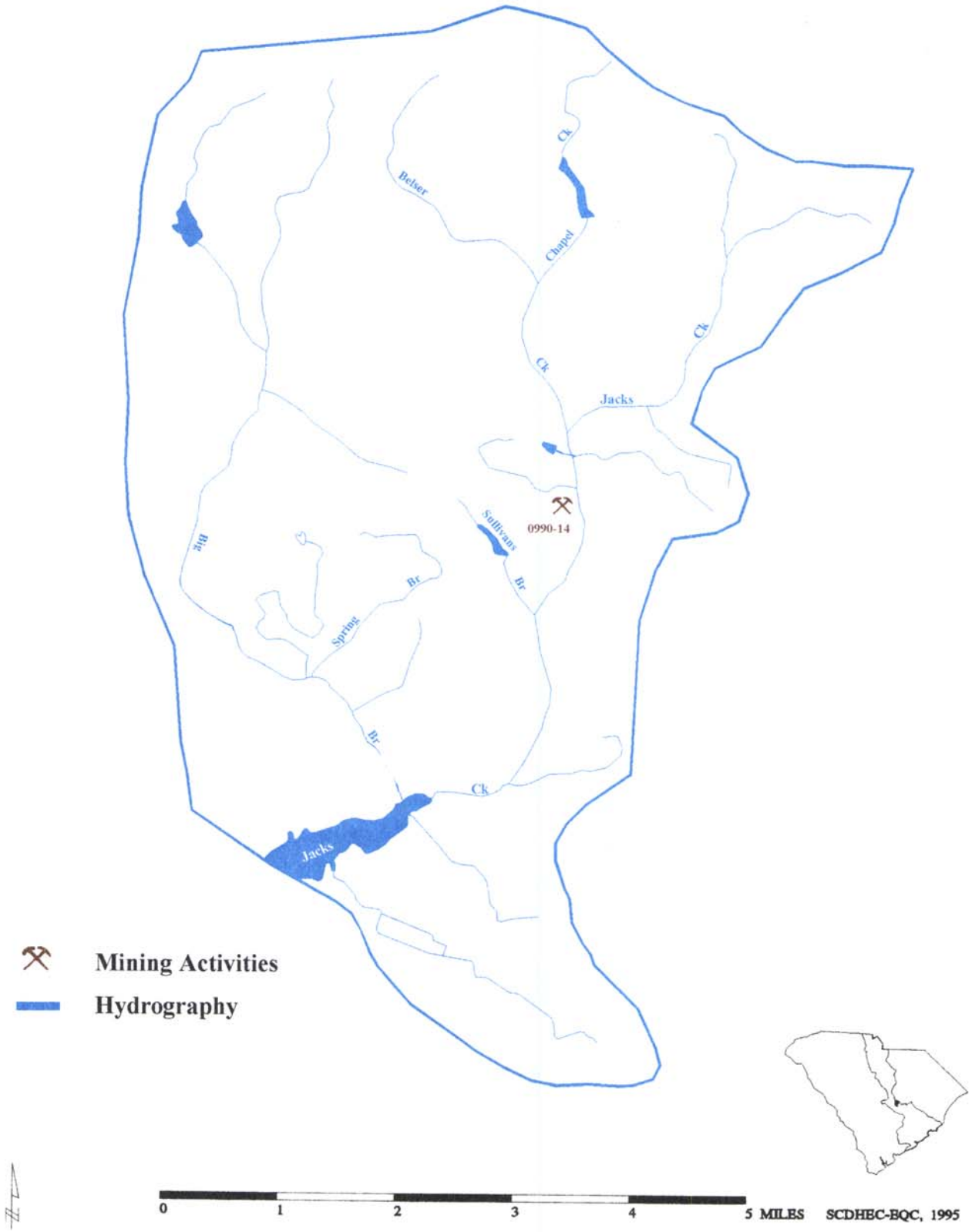
Hydrography



0 1 2 3 4 5 MILES SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality

Jacks Creek Watershed
(03050111-030)



03050111-040

(Tawcaw Creek)

General Description

Watershed 03050111-040 is located in Clarendon County and consists primarily of ***Tawcaw Creek*** and its tributaries. The watershed occupies 21,056 acres of the Upper Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Noboco-Bonneau-Cantey-Paxville series. The erodibility of the soil (K) averages 0.17; the slope of the terrain averages 3%, with a range of 0-10%. Land use/land cover in the watershed includes: 0.16% urban land, 32.28% agricultural land, 25.21% scrub/shrub land, 34.26% forested land, 4.01% forested wetland, 0.12% nonforested wetland, and 3.95% water.

Tawcaw Creek accepts the drainage from Little Tawcaw Creek and Penn Branch before flowing into Lake Marion. There are a total of 54.7 stream miles in this watershed, all classified FW. The Santee National Wildlife Refuge is an additional natural resource in the watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Tawcaw Creek - The Tawcaw Creek station is sampled by both SCDHEC and SCPSA. Aquatic life uses are fully supported based on the SCPSA year round data. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. Recreational uses are not supported due to fecal coliform bacteria excursions.

Tawcaw Creek Arm of Lake Marion - Eutrophication studies classified Tawcaw Creek as Category II for intermediate trophic condition, which could be susceptible to further degradation. Aquatic macrophytes have proliferated and public access has been restricted in Tawcaw Creek due to the shallow depth and high nutrient levels. Tawcaw Creek was stocked with grass carp in 1994, at a rate of 15 fish/vegetated acre, for a total of 5,000 fish between Potato Creek and Tawcaw Creek. This site is sampled by SCPSA. Aquatic life and recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Point Source Contributions

Tawcaw Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen and fecal coliform concerns.

LAND APPLICATION SYSTEM FACILITY NAME	*PERMIT # TYPE*
SPRAY ON GOLF COURSE TOWN OF SUMMERTON	ND0063401 MINOR MUNICIPAL

SPRAYFIELD	ND0066117
SIGFIELD GOLF COURSE	MINOR COMMUNITY

Landfill Activities

There is one closed municipal landfill in this watershed in addition to those listed below.

LANDFILL NAME	*PERMIT #*
FACILITY TYPE	*STATUS*
OLD SUMMERTON LANDFILL	----
MUNICIPAL	CLOSED

Nonpoint Source Contributions

Tawcaw Creek is included on the §319 list of waters impacted by urban runoff, and is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen and fecal coliform concerns. Water samples collected by the Department indicate elevated fecal coliform and nutrient levels on numerous occasions, and scattered excursions of dissolved oxygen and BOD_5. Tawcaw Creek is also included on the §304(l) long list of waters impacted by nontoxic pollutants.

Growth Potential

There is low to moderate potential for growth in this watershed occurring along the lakeshore.

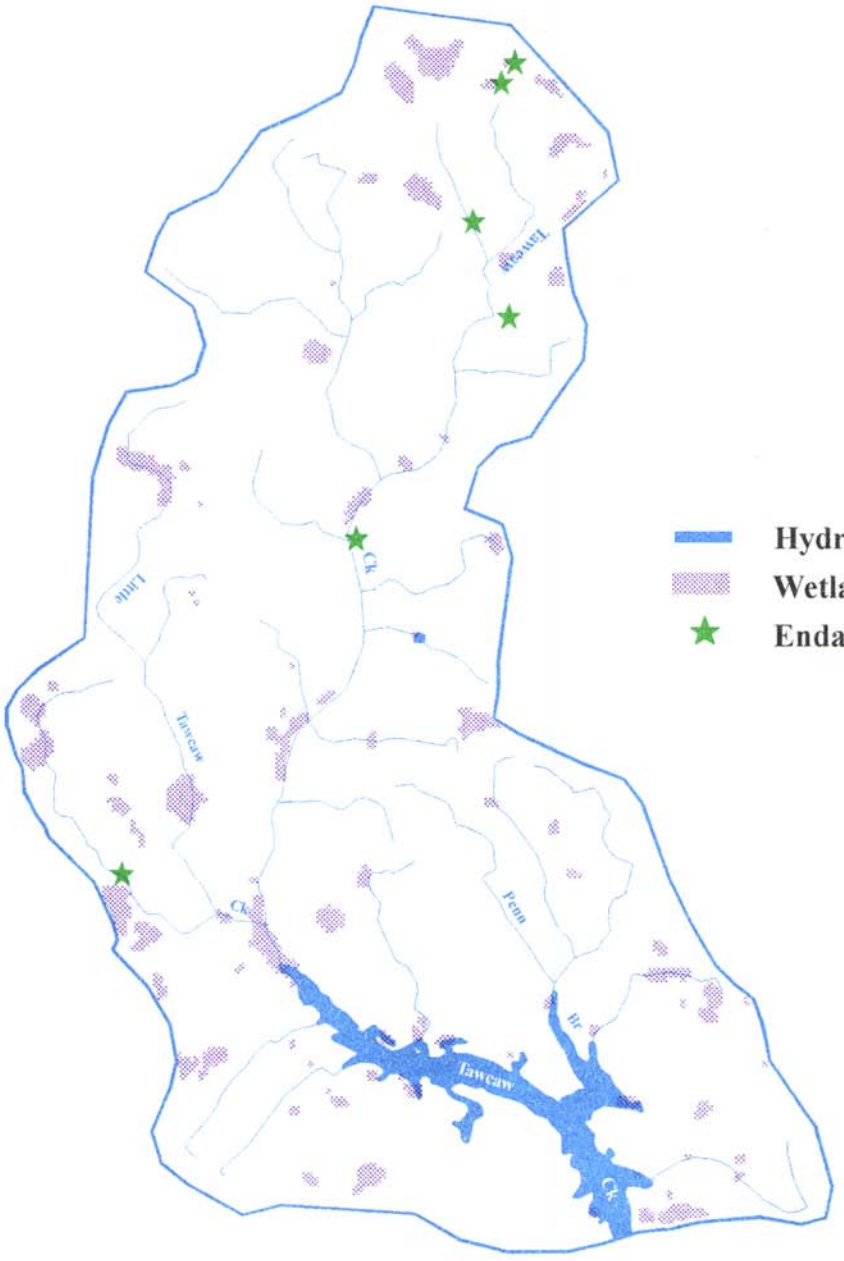
Implementation Strategy

Recreational uses for Tawcaw Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Tawcaw Creek Watershed

(03050111-040)



Hydrography

Wetlands

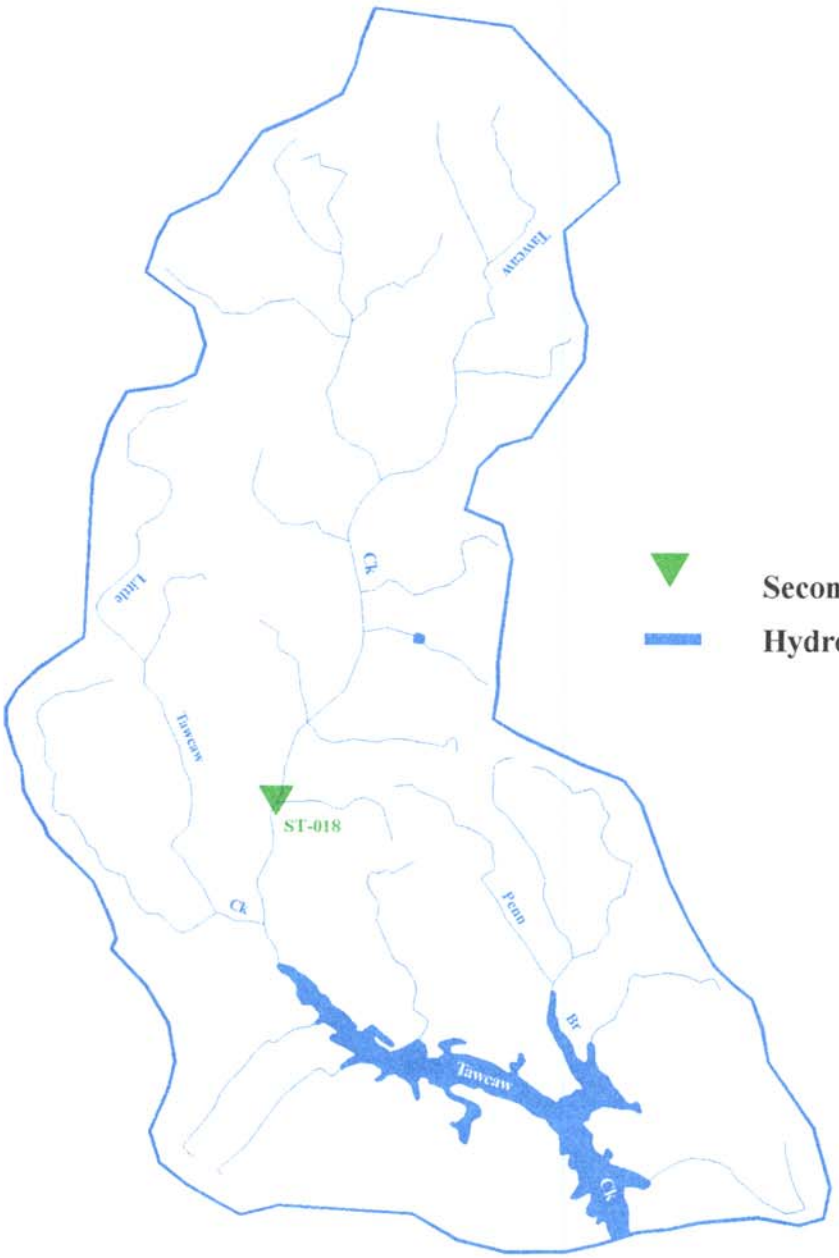
Endangered Species

0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

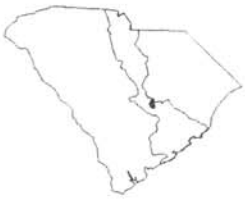
Water Quality Monitoring Stations

Tawcaw Creek Watershed
(03050111-040)



Secondary Stations

Hydrography

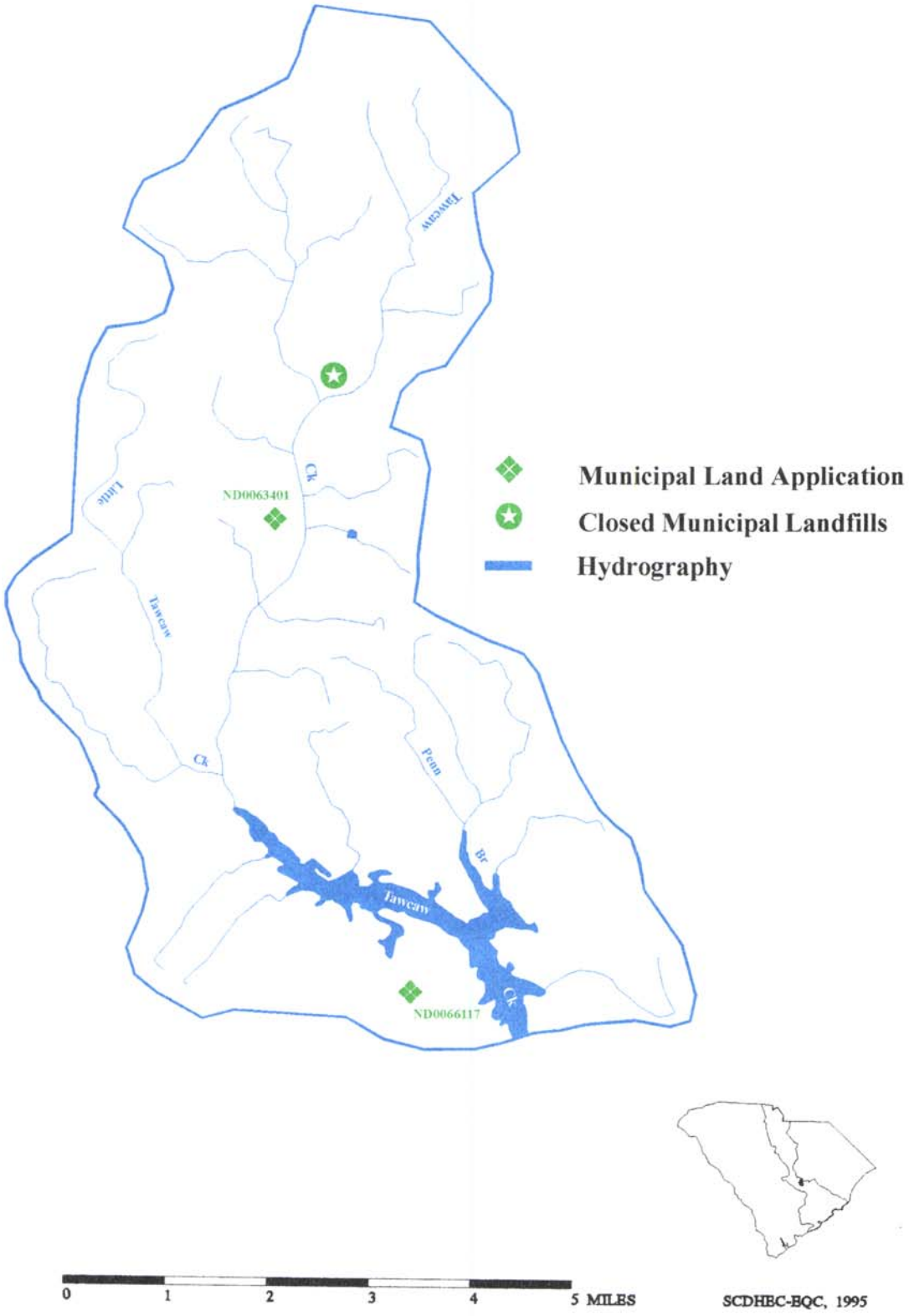


0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality

Tawcaw Creek Watershed
(03050111-040)



03050111-050

(Potato Creek)

General Description

Watershed 03050111-050 is located in Clarendon County and consists primarily of ***Potato Creek*** and its tributaries. The watershed occupies 36,920 acres of the Upper Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Noboco-Bonneau-Paxville-Rutledge series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 2%, with a range of 0-10%. Land use/land cover in the watershed includes: 0.03% urban land, 18.77% agricultural land, 26.45% scrub/shrub land, 35.78% forested land, 8.33% forested wetland, 0.23% nonforested wetland, and 10.43% water.

Potato Creek accepts the drainage of Wyboo Swamp, Church Branch, and Big Branch as it forms an arm of Lake Marion. Wyboo Swamp is formed from the drainage of Dean Swamp, Buckhead Branch, McCoys Branch, Rooty Branch, Bluff Branch, White Oak Branch (Three Hole Swamp), Birch Branch, White Oak Creek, Lizzies Branch (Clubhouse Branch) and Carroll Slough. There are a total of 91.7 stream miles in this watershed, all classified FW. The Santee National Wildlife Refuge extends over a large portion of the watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Potato Creek - Aquatic life uses are fully supported for the Potato Creek embayment of Lake Marion, but may not be fully supported at Camp Bob Cooper due to a high concentration of zinc measured in water in 1989, and a very high concentration measured in 1992, compounded by a significantly increasing trend in turbidity and a significantly decreasing trend in pH. However, significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported at both sites, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration near Camp Bob Cooper. Aquatic macrophytes have proliferated and public access has been restricted in Potato Creek due to shallow depth and high nutrient levels. Potato Creek was stocked with grass carp in 1994, at a rate of 15 fish/vegetated acre, for a total of 5,000 fish between Potato Creek and Tawcaw Creek.

Wyboo Swamp - Aquatic life and recreational uses are fully supported. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrients were nitrogen and phosphorus in Wyboo Swamp. Eutrophication studies classified Wyboo Swamp as Category II for intermediate trophic condition, which could be susceptible to further degradation. Swimming usage of Wyboo Swamp may be impaired due to elevated chlorophyll levels.

Lizzies Branch - This site is sampled by SCPSA. Aquatic life and recreational uses are fully supported.

Lizzies Branch Tributaries - There are three Rickenbaker Canals sampled by SCPSA. Aquatic life and recreational uses are fully supported at all sites.

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
WYBOO CREEK CAMP BOB COOPER	14-N01 ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

LAND APPLICATION SYSTEM *FACILITY NAME*	*PERMIT #* *TYPE*
SPRAYFIELD WYBOO PLANTATION I	ND0072419 MINOR COMMUNITY
SPRAY ON GOLF COURSE WYBOO PLANTATION II	ND0072427 MINOR COMMUNITY
SPRAYFIELD CYPRESS POINT	ND0062227 MINOR COMMUNITY

Nonpoint Source Contributions

Potato Creek is included on the §319 list of waters impacted by agricultural activities. Information supplied by Department engineers and outside agencies, together with samples collected by the Department indicate scattered elevated levels of toxic materials and pH excursions. Computer modeling indicates a high potential for NPS problems from agricultural activities for this stream.

Growth Potential

There is a high potential for continued residential and commercial development along the lakeshore, which includes several new subdivisions and golf courses. The watershed also contains the Clarendon County Airport.

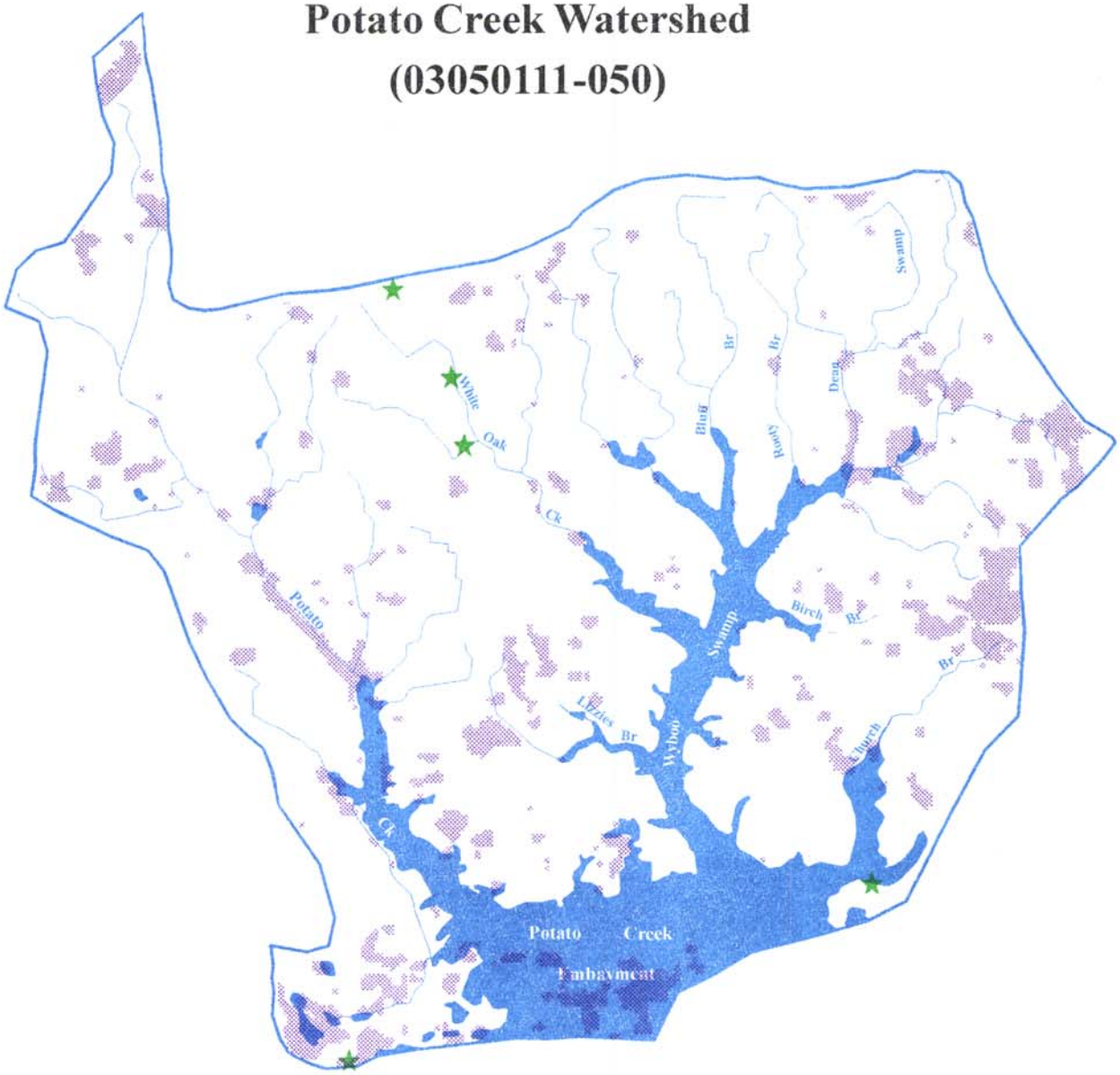
Implementation Strategy

Aquatic life uses for the Potato Creek Arm of Lake Marion are impaired by elevated zinc concentrations from unknown sources. An evaluation of the situation is ongoing. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Potato Creek Watershed

(03050111-050)



Hydrography

Wetlands

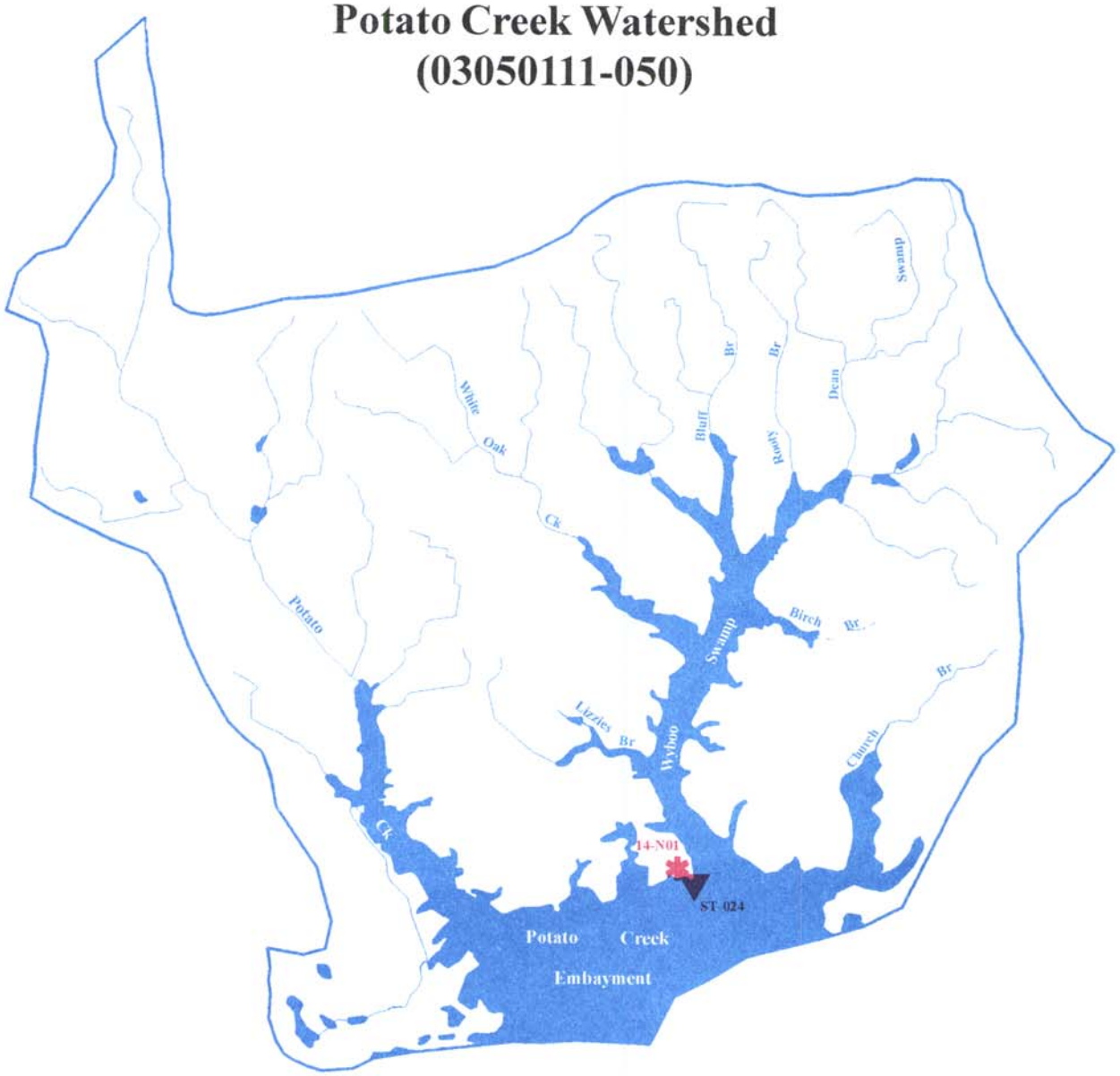
Endangered Species

0 1 2 3 4 5 MILES

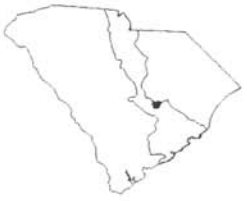
SCDHEC-BQC, 1995

Water Quality Monitoring Stations

Potato Creek Watershed
(03050111-050)



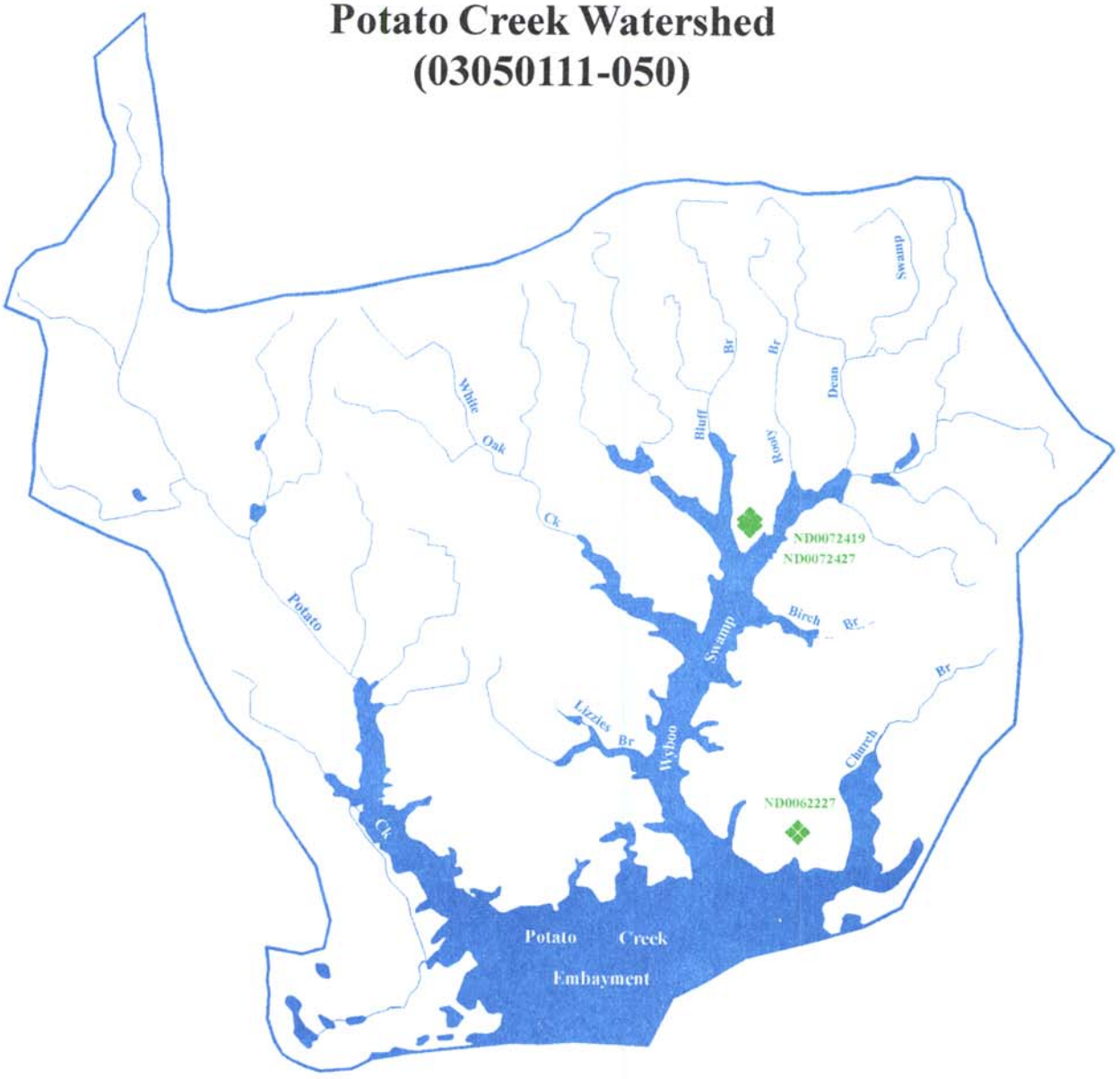
- Primary Stations
- Sanitary Bathing Areas
- Hydrography



SCDHEC-BQC, 1995

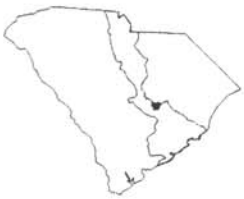
Activities Potentially Affecting Water Quality

Potato Creek Watershed
(03050111-050)



Municipal Land Applications

Hydrography



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050112-010

(Santee River)

General Description

Watershed 03050112-010 is located in Clarendon, Williamsburg, and Berkeley Counties and consists primarily of the ***Santee River*** and its tributaries downstream of Lake Marion to Crawl Creek (rediversion canal). The watershed occupies 11,193 acres of the Upper and Lower Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Chastain-Tawcaw-Lynchburg-Emporia series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 2%, with a range of 0-6%. Land use/land cover in the watershed includes: 0.01% urban land, 13.63% agricultural land, 12.25% scrub/shrub land, 0.21% barren land, 43.53% forested land, 30.32% forested wetland, 0.01% nonforested wetland, and 1.04% water.

This segment of the Santee River flows out of the Santee Dam of Lake Marion and incorporates the drainage of the Little River, the Dead River, Highland Creek (Hicks Branch, Meetinghouse Branch, Bennetts Branch), Doctors Branch (Torkiln Branch, Mill Branch), Mt. Hope Swamp (Hagan Branch, Long Branch), Campbell Branch, and Walnut Branch. There are numerous ponds and oxbow lakes used for recreation and water supply, and a total of 240.8 stream miles, all classified FW. The oxbow lakes include Couturier Lake, Cordes Lake, Solomon Lake, Little Solomon Lake, Wood Lake, and Maham Lake.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Santee River - There is one SCDHEC and one SCPSA monitoring site along this section of the Santee River. Recreational uses are fully supported at both sites. The SCPSA site is at Wilsons Landing, and aquatic life uses are fully supported. Aquatic life uses are only partially supported at the SCDHEC site near U.S. Hwy. 52, due to dissolved oxygen excursions, compounded by a significantly decreasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions.

Activities Potentially Affecting Water Quality

Nonpoint Source Contributions

The Santee River is included on the §304(l) long list of waters impacted by nontoxic pollutants.

Growth Potential

There is a low potential for growth projected in this watershed, which is occupied largely by the Santee National Wildlife Refuge.

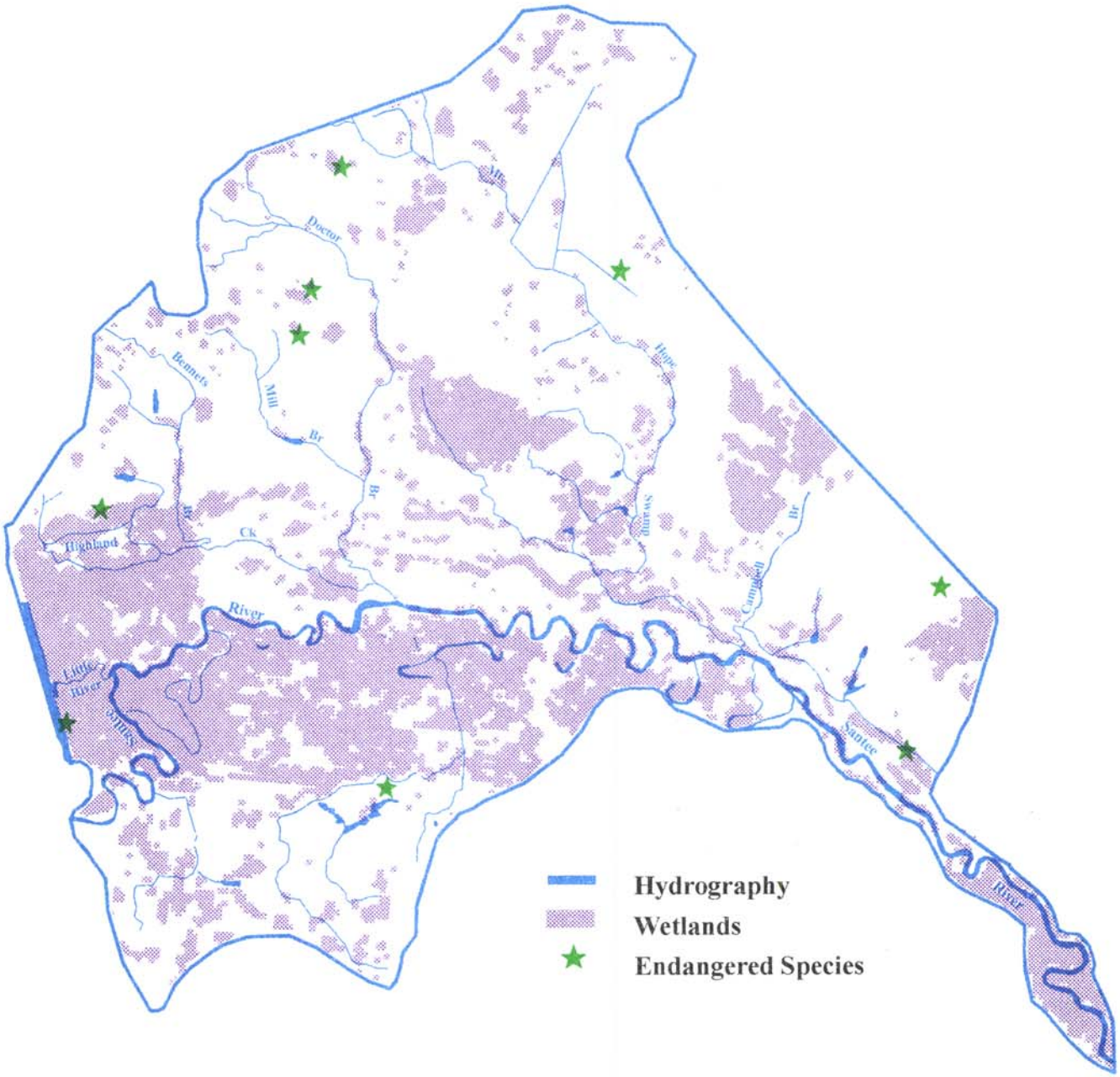
Implementation Strategy

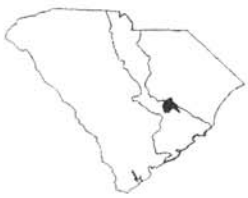
Aquatic life uses for this section of the Santee River are impaired by low dissolved oxygen concentrations related to the rediversion project. An evaluation of the situation is ongoing. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Santee River Watershed

(03050112-010)





0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Santee River Watershed
(03050112-010)

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050112-020

(Rediversion Canal)

General Description

Watershed 03050112-020 extends through Berkeley County and consists primarily of the ***Rediversion Canal (Crawl Creek)*** and its tributaries. The watershed occupies 34,404 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Chastain-Tawcaw-Pantego-Noboco-Bonneau series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 2%, with a range of 0-6%. Land use/land cover in the watershed includes: 2.87% urban land, 12.71% agricultural land, 16.52% scrub/shrub land, 3.87% barren land, 28.35% forested land, 30.58% forested wetland, and 5.10% water.

The 11.5 mile Rediversion Canal connects Lake Moultrie with the lower Santee River near the Town of St. Stephen. Mattassee Lake accepts drainage from Crawl Creek (Lifeland Branch, Johns Run, Big Bay Branch) and Curriboo Branch before entering the Rediversion Canal. Also draining into the canal are Ponteaux Branch and Mattassee Branch. There are a total of 84.7 stream miles in this watershed, all classified FW. An additional natural resource is the Francis Marion National Forest, which extends over the base of the watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Rediversion Canal - There is one SCDHEC and one SCPSA monitoring site along the Rediversion Canal. Aquatic Life and recreational uses are fully supported at both sites. However, aquatic life uses may be threatened at the downstream site by a significantly decreasing trend in dissolved oxygen concentrations.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
UNNAMED CREEK TO REDIVERSION CANAL TOWN OF ST STEPHEN PIPE #: 001 FLOW: 0.9 WQL FOR TRC, DO, NH3-N, BOD5	SC0025259 MINOR MUNICIPAL WATER QUALITY
CURRIBOO BRANCH ALBANY INTNL/PRESS F PIPE #: 001 FLOW: M/R WQL FOR NH3-N, TRC, DO	SC0002569 MINOR INDUSTRIAL WATER QUALITY

CURRIBOO BRANCH ALBANY INTNL/PRESS F PIPE #: 002 FLOW: M/R WQL FOR BOD_5, NH3-N	SC0002569 MINOR INDUSTRIAL WATER QUALITY
LAND APPLICATION SYSTEM FACILITY NAME	*PERMIT #* *TYPE*
SPRAYFIELD ALBANY INTNL/FELT DIV.	ND0065901 MINOR COMMUNITY

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
SANTEE MINERALS, INC. GREGG MINE	0465-08 SAND
DAVID & RALPH WOODWARD OLD FIELD MINE	0929-08 SAND/CLAY

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the Town of St. Stephen, and the communities of Pineville and a portion of Russellville. The Town of St. Stephen has both water and sewer services available, which may aid in attracting development to the area. Another source of potential growth is U.S. 52, which is scheduled to be widened to four lanes.

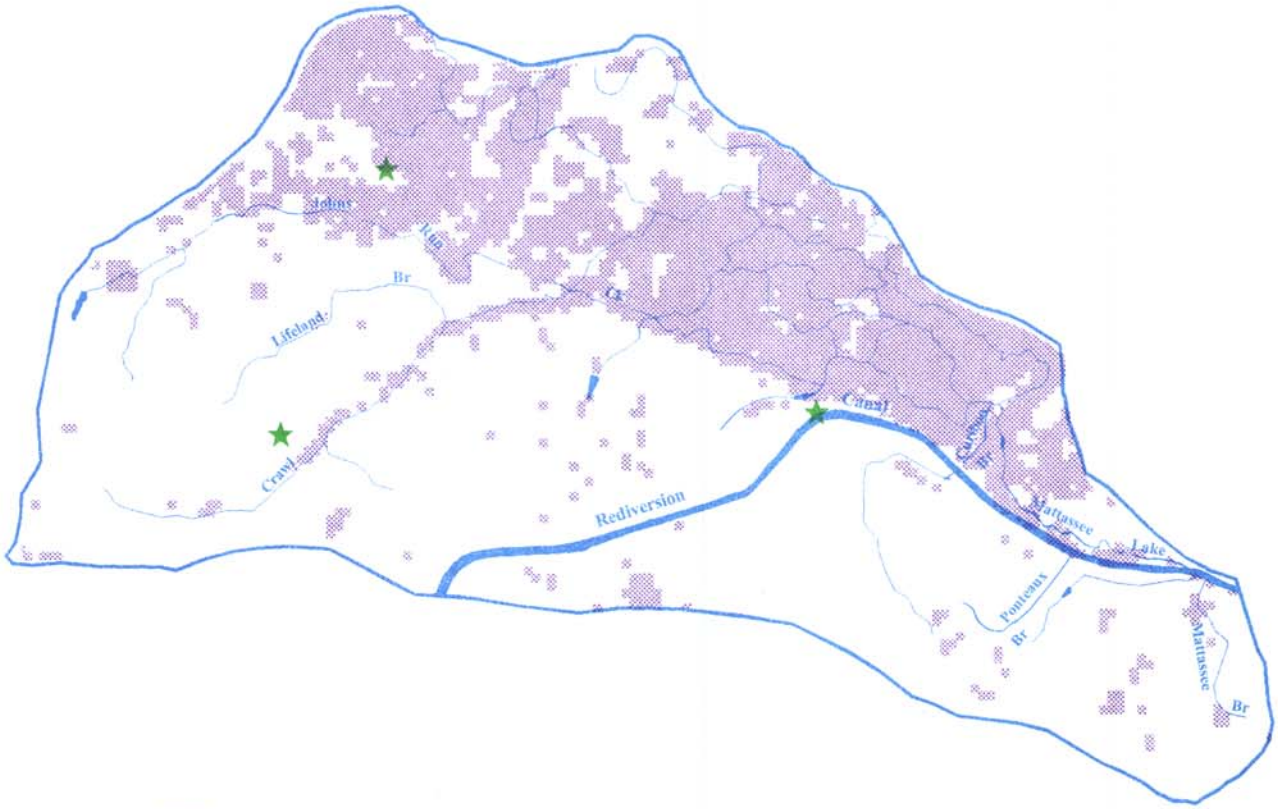
Implementation Strategy

The Rediversion Canal has a declining trend in dissolved oxygen concentrations due to unknown sources. An evaluation of this situation is ongoing. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Rediversion Canal Watershed

(03050112-020)



Hydrography

Wetlands

Endangered Species

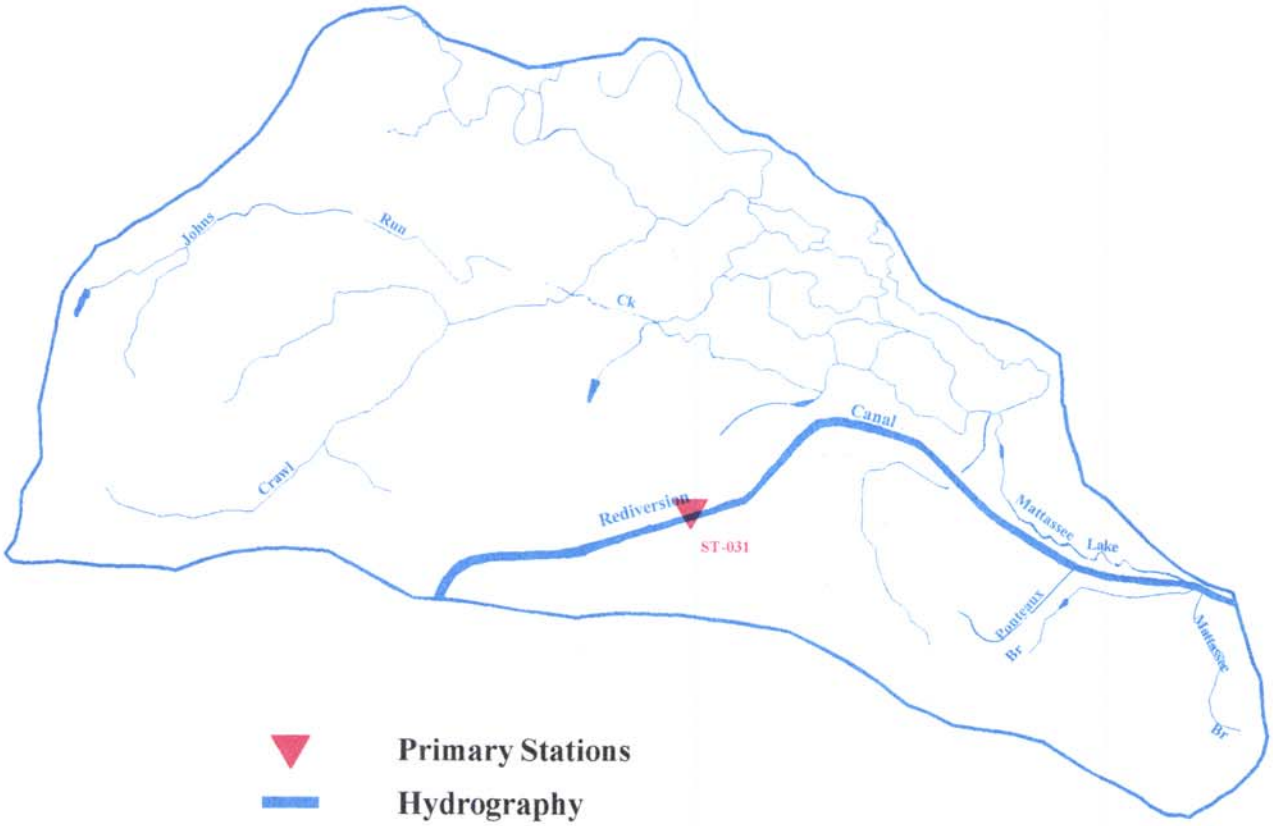
0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

Water Quality Monitoring Stations

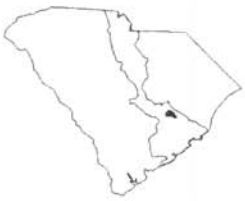
Rediversion Canal Watershed

(03050112-020)



Primary Stations

Hydrography



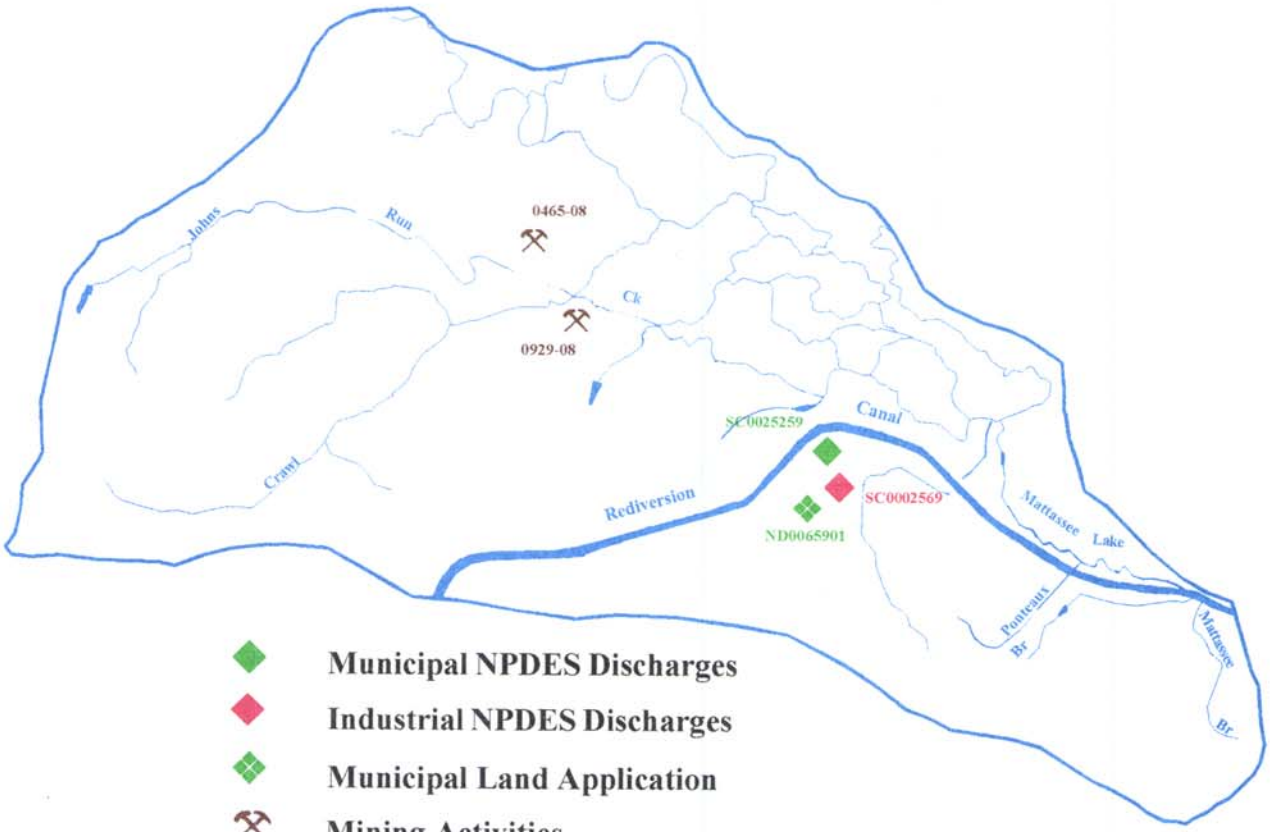
0 1 2 3 4 5 MILES

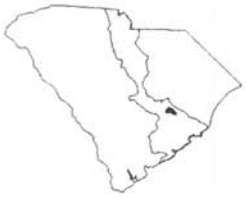
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Rediversion Canal Watershed

(03050112-020)





SCDHEC-EQC, 1995

03050112-030

(Santee River)

General Description

Watershed 03050112-030 is located in Williamsburg, Berkeley, and Georgetown Counties and consists primarily of the ***Santee River*** and its tributaries from the Rediversion Canal to Wadmacon Creek. The watershed occupies 167,226 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Chastain-Bladen-Wahee-Tawcaw-Hobcaw series. The erodibility of the soil (K) averages 0.17; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 0.11% urban land, 3.60% agricultural land, 7.22% scrub/shrub land, 0.33% barren land, 57.92% forested land, 28.64% forested wetland, 1.15% nonforested wetland, and 1.02% water.

This lowest segment of the Santee River accepts the upstream river segment drainage (03050112-010), together with Wedboo Creek (Meeting House Branch, Beauford Branch), Savanna Creek, Byno Creek, Wittee Lake (June Branch), Wittee Branch (Mill Creek), and Ferry Lake. Further downstream, Dutart Creek, Euchaw Creek (Bark Island Slough, Beaman Branch, Bay Branch, Pole Branch), and Put-on Branch enter the river. Hell Hole Bay extends across the watershed near the headwaters of Dutart and Savanna Creeks. Gravel Run (Devils Lodge Branch) and Gal Branch connect Dutart Creek to Echaw Creek, and June Pond connects Echaw Creek to Put-on Branch. Velvet Branch and Red Bluff Creek flow into the river at the base of the watershed. There are a total of 430.5 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Hell Hole Bay and its tributaries. Additional natural resources include the Francis Marion National Forest, the Hellhole Bay Wilderness Area, and the Guilliard Lake Scenic Area.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Santee River - Aquatic life uses are fully supported, but may be threatened by significantly decreasing trends in dissolved oxygen and pH, and an elevated concentration of lead measured in water in 1993. Although dissolved oxygen excursions occurred, they were typical of values seen in streams receiving significant wetland drainage and were considered natural, not standards violations. In the 1992 sediment sample, the pesticide P,P'DDT, was detected along with a very high concentration of zinc. Although the use of DDT was banned in 1973, it is very persistent in the environment. Significantly decreasing trends in BOD_5 and total phosphorus concentration suggest improving conditions. Recreational uses are only partially supported due to fecal coliform excursions under Class FW standards, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
SANTEE RIVER PROUVOST USA,INC. PIPE #: 001 FLOW: 0.417	SC0000990 MAJOR INDUSTRIAL EFFLUENT
DUTART CREEK MARTIN MARIETTA/GEORGETOWN II PIPE #: 001 FLOW: 10.8 WETLAND; GROUNDWATER	SC0035882 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Contributions

The Santee River is included on the §319 list of waters impacted by agricultural activities. Information supplied by the National Estuarine Inventory and water samples collected by the Department indicate elevated levels of toxic materials (DDT, zinc), together with fecal coliform and dissolved oxygen excursions on numerous occasions and scattered elevated nutrient levels. The Santee River is also included on the §304(l) long list of waters impacted by nontoxic pollutants.

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
MARTIN MARIETTA (SOUTHERN AGGREGATES) JAMESTOWN QUARRY	0885-08 LIMESTONE
MARTIN MARIETTA AGGREGATES GEORGETOWN QUARRY	0103-22 LIMESTONE

Growth Potential

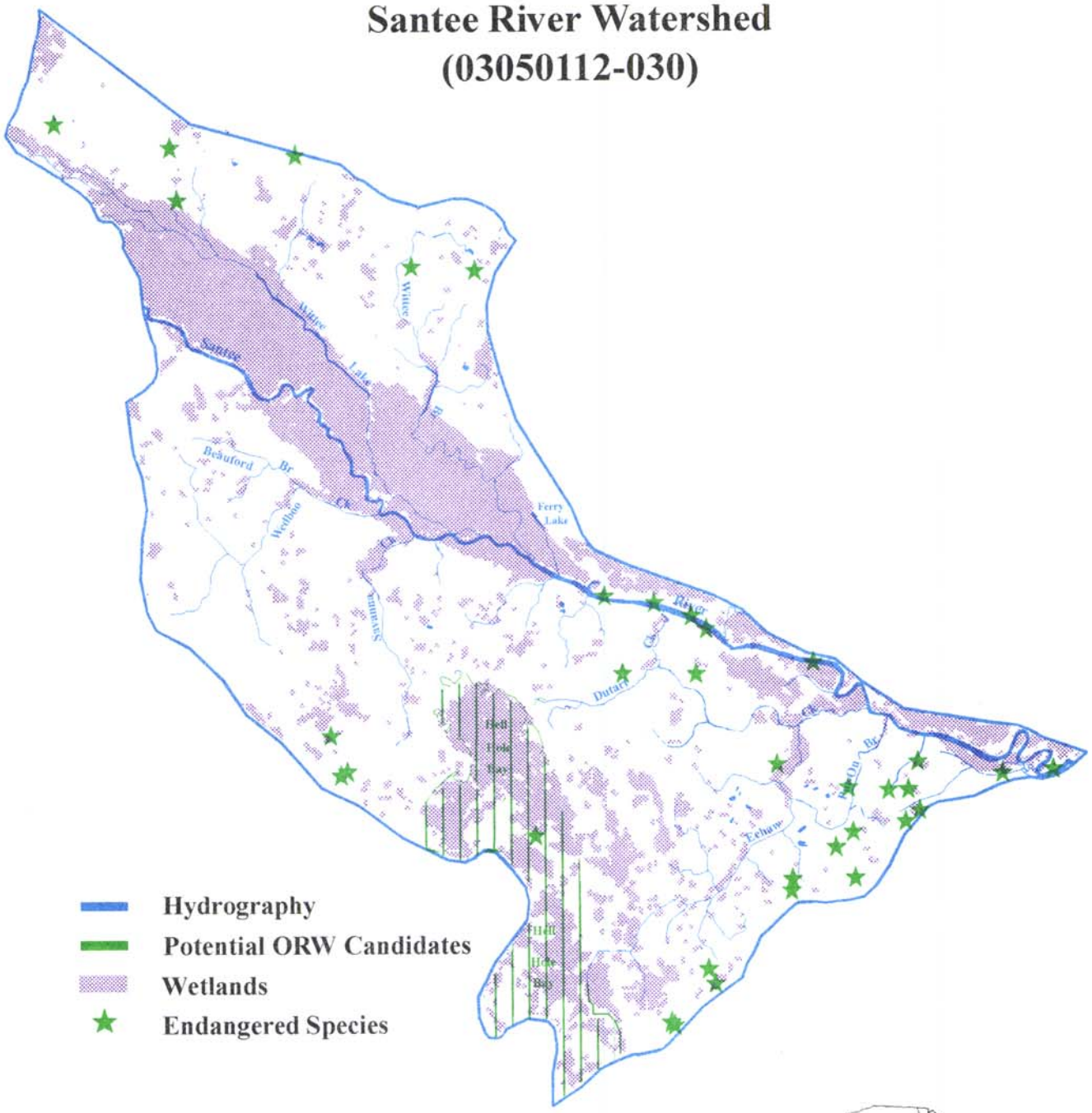
There is a low potential for growth in this watershed, which contains the Town of Jamestown and the communities of Alvin, Honey Hill, and Shulerville. Jamestown provides water, but there is no sewer service. The majority of the watershed extends over wetland (bays and swamps) areas.

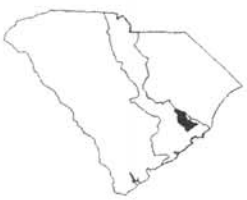
Implementation Strategy

Recreational uses for this section of the Santee River are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Santee River Watershed
(03050112-030)



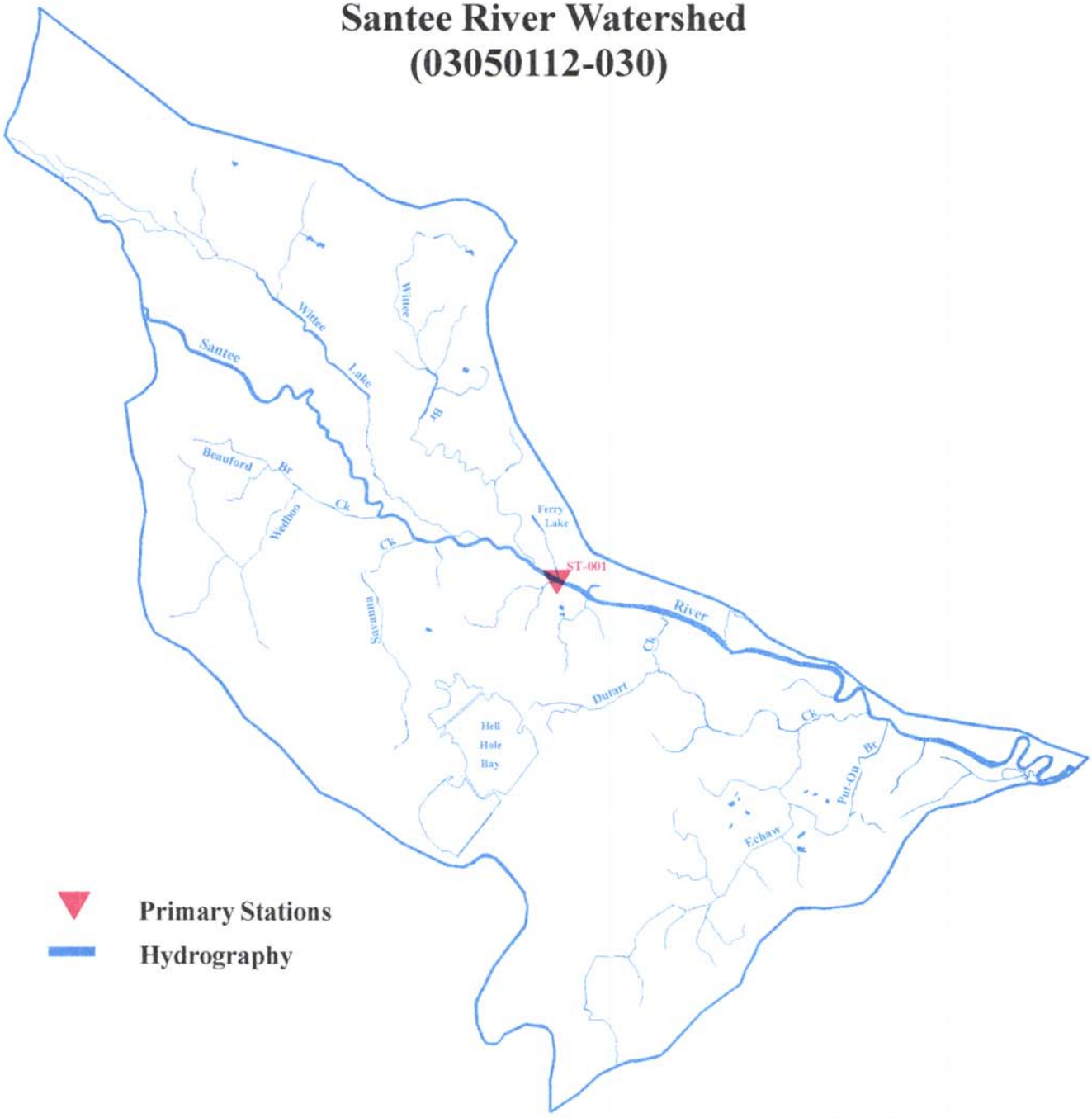


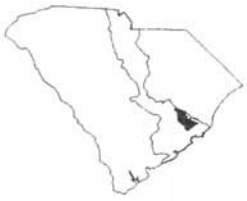
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Santee River Watershed
(03050112-030)



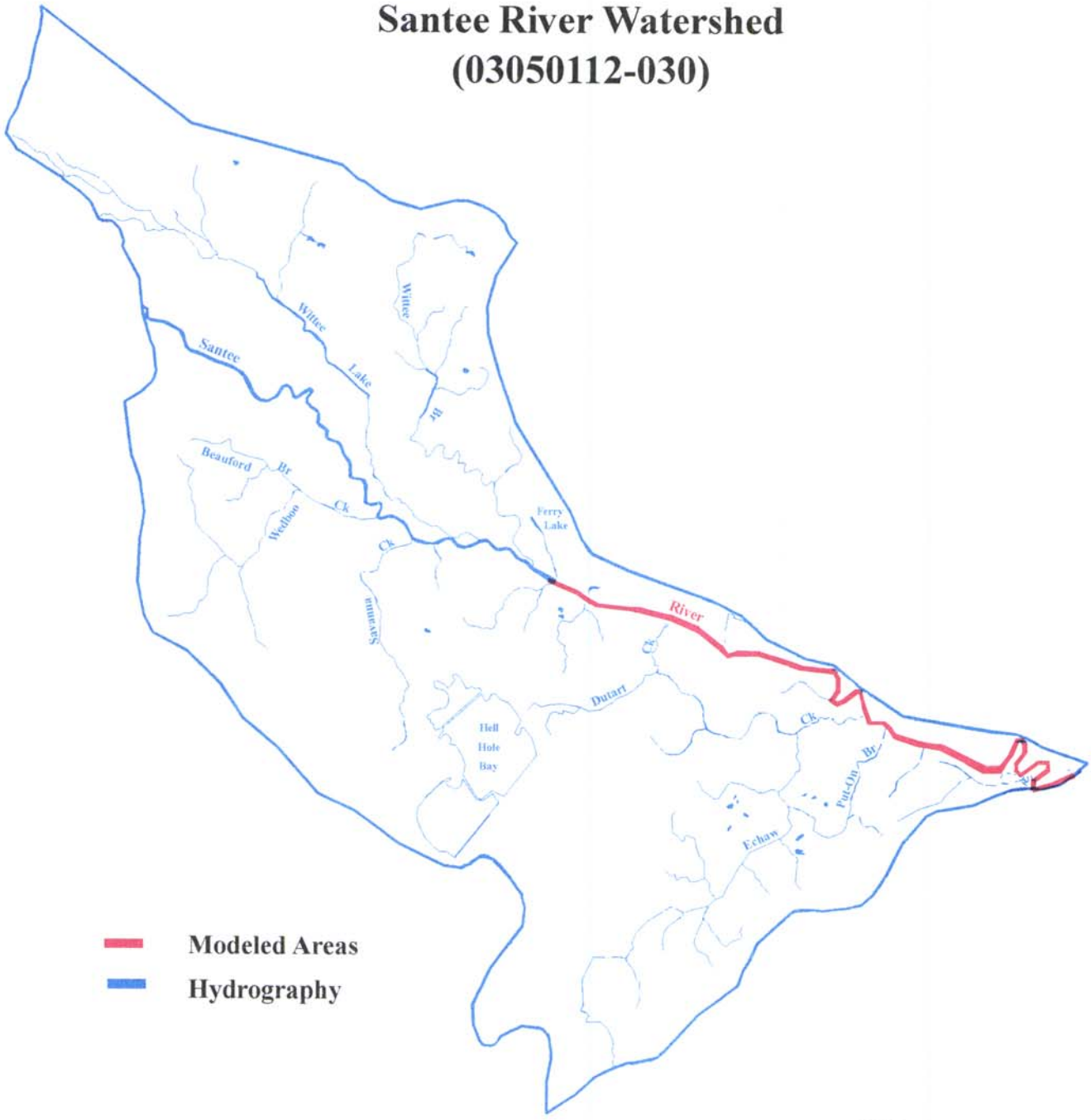


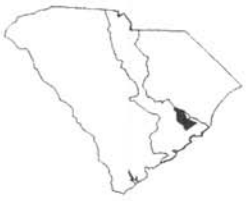
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Santee River Watershed
(03050112-030)

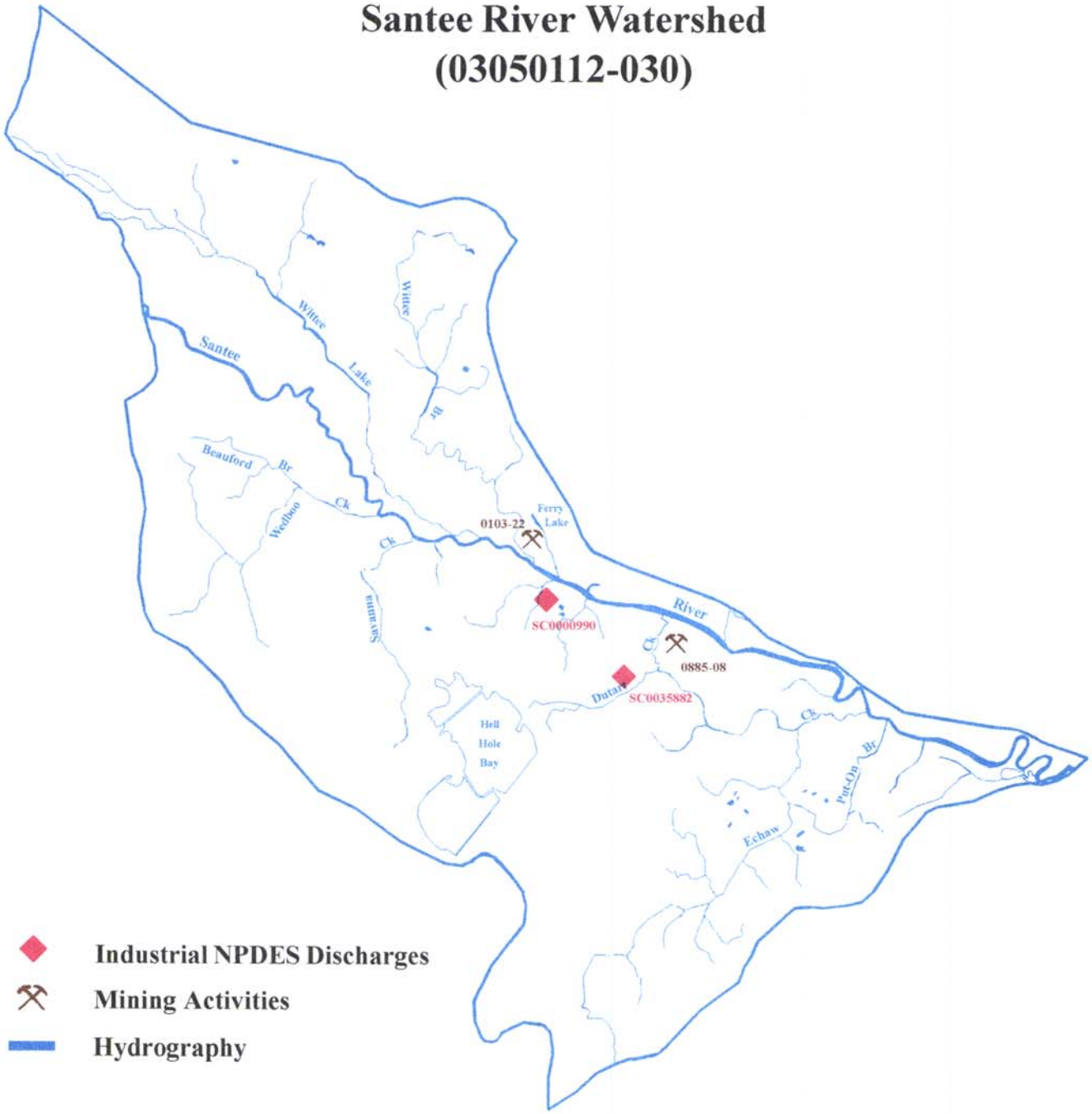


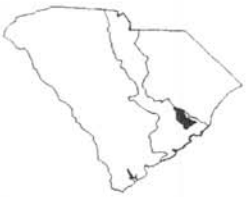


SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Santee River Watershed
(03050112-030)





SCDHEC-EQC, 1995

03050112-040

(Wadmacon Creek)

General Description

Watershed 03050112-040 is located in Georgetown and Williamsburg Counties and consists primarily of ***Wadmacon Creek*** and its tributaries. The watershed occupies 45,552 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Bladen-Wahee-Levy-Chastain series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 0.02% urban land, 2.16% agricultural land, 19.08% scrub/shrub land, 0.76% barren land, 53.33% forested land, 16.06% forested wetland, 8.54% nonforested wetland, and 0.06% water.

Wadmacon Creek flows through Dawhoo Lake and receives drainage from Cedar Creek (Long Branch, Brunson Branch) before flowing into the South Santee River watershed. The Cutoff connects Wadmacon Creek and the Santee River watershed (03050112-030). There are a total of 118.2 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Wadmacon Creek from its confluence with Dawhoo Lake to the North Santee River.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Wadmacon Creek - Due to the inaccessibility of this creek, no water quality data are available. The creek is best characterized as a typical low country swamp drainage.

Growth Potential

There is a low potential for growth in this watershed.

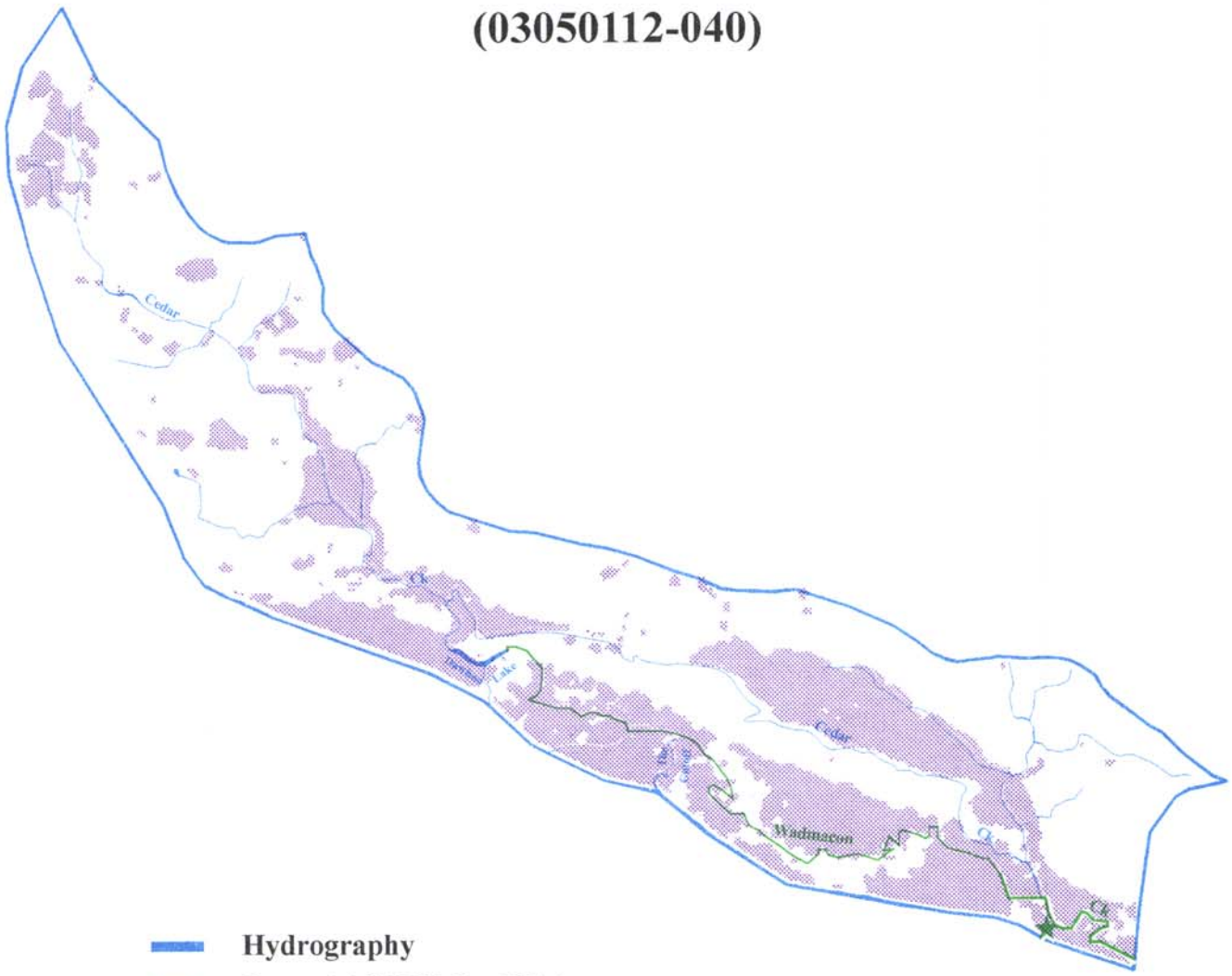
Implementation Strategy

The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Wadmacon Creek Watershed

(03050112-040)

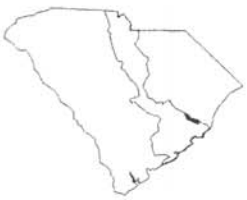


Hydrography

Potential ORW Candidates

Wetlands

Endangered Species



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050112-050

(Wambaw Creek)

General Description

Watershed 03050112-050 is located in Berkeley and Charleston Counties and consists primarily of ***Wambaw Creek*** and its tributaries. The watershed occupies 51,851 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Chipley-Yauhannah-Yemassee-Leon series. The erodibility of the soil (K) averages 0.12; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 4.68% scrub/shrub land, 0.03% barren land, 82.53% forested land, 11.62% forested wetland, 1.10% nonforested wetland, and 0.03% water.

Wambaw Creek accepts drainage from Wambaw Swamp, Mechaw Creek, Mill Branch, and Cane Branch (Keepers Branch). Little Wambaw Swamp connects Wambaw Swamp and Mechaw Creek. Further downstream, Big Morgan Branch (Little Morgan Branch) enters Wambaw Creek and flows into the South Santee River watershed (03050112-060). Cedar Creek drains into Wambaw Creek at the base of the watershed and flows into the North Santee River watershed (03050112-060). There are a total of 206.7 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Wambaw Creek and its tributaries. An additional natural resource is the Francis Marion National Forest, which extends across the entire watershed. Located within the National Forest is the Wambaw Creek National Wilderness Area, the Wambaw Swamp National Wilderness Area, and the proposed Waterhorn Historic Area.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0302).

Wambaw Creek - Aquatic life and recreational uses are fully supported. Although dissolved oxygen excursions occurred, this creek is a typical swamp drainage, and ceases to flow and stagnates in the summer months. This is considered to be a natural condition, not a standards violation.

Mechaw Creek - Aquatic life uses are fully supported. Although dissolved oxygen excursions occurred, this creek is a typical swamp drainage, and ceases to flow and stagnates in the summer months. This is considered to be a natural condition, not a standards violation. A high concentration of copper was measured in water in 1989, as well as an elevated concentration of chromium. A very high concentration of mercury was measured in the 1989 sediment sample, and a very high concentration of lead was detected in the 1991 sediment sample. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Growth Potential

There is a low potential for growth projected in this watershed.

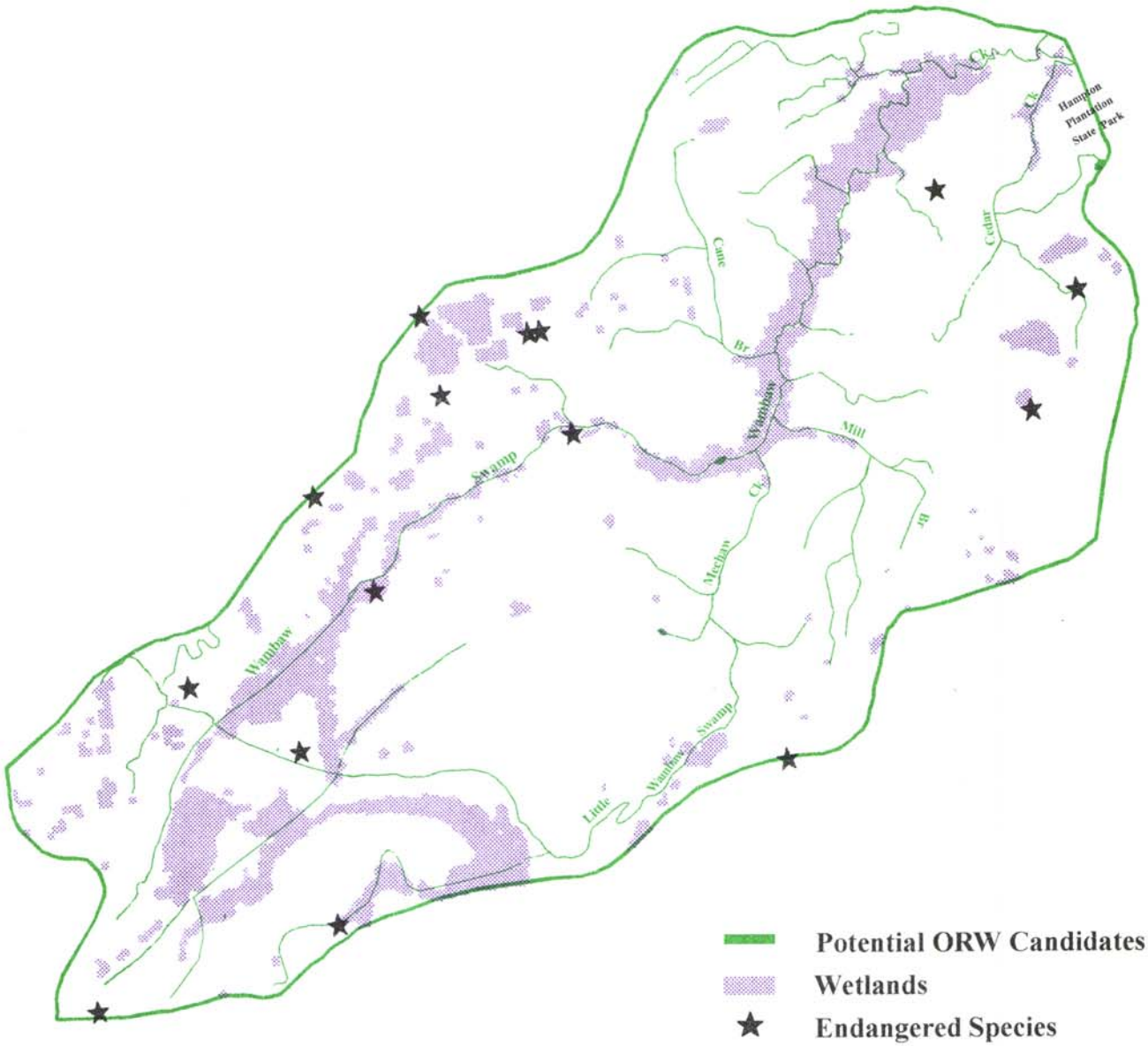
Implementation Strategy

Recreational uses for Mechaw Creek are impaired by elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Wambaw Creek Watershed

(03050112-050)



Potential ORW Candidates

Wetlands

Endangered Species

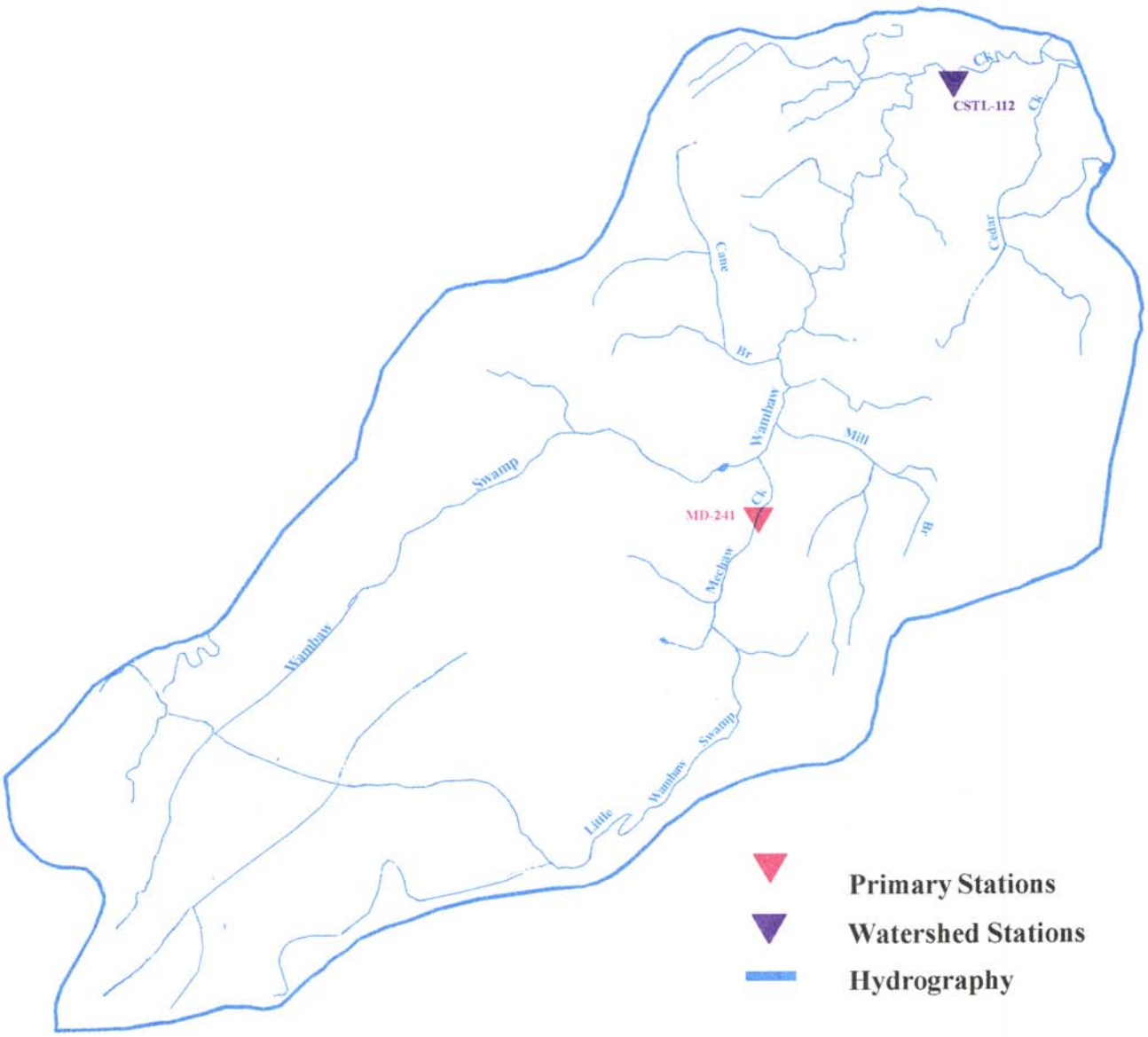
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Wambaw Creek Watershed

(03050112-050)



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050112-060

(South Santee River, North Santee River)

General Description

Watershed 03050112-060 is located in Charleston County and consists primarily of the ***South Santee River and the North Santee River*** and their tributaries. The watershed occupies 66,665 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Bohicket-Capers-Chipley series. The erodibility of the soil (K) averages 0.19; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 0.00% urban land, 0.03% agricultural land, 8.83% scrub/shrub land, 0.27% barren land, 35.53% forested land, 6.24% forested wetland, 39.47% nonforested wetland, and 9.63% water.

The lower Santee River divides into the South Santee River and the North Santee River, both draining into the Atlantic Ocean. Both the South and North Santee Rivers are classified FW from their origin to the Highway 17 crossing, SA from the Highway 17 crossing to 1000 feet below the intracoastal waterway (ICWW) crossing, and SFH from the ICWW to the Atlantic Ocean. There are a total of 72.1 stream miles in this watershed. The South Santee River accepts drainage from Chicken Creek, Hampton Creek, Montgomery Creek, Garfish Creek, Sixmile Creek, and Collins Creek. Pleasant Creek connects Sixmile Creek to the South Santee River. The Fourmile Creek Canal and Alligator Creek also drain into the South Santee River. Sall Creek drains directly into the ICWW, which bisects the South and North Santee Rivers.

The North Santee River accepts drainage from Cedar Creek, Pole Branch, Bonny Clabber Creek, White Oak Creek, and Sixmile Creek. Minim Creek drains into the North Santee River and into the North Santee Bay, and incorporates the drainage of Kinloch Creek (Bluff Creek), Pleasant Meadow Creek, Bella Creek, and Cork Creek. Atchison Creek and Fourmile Creek Canal drain directly into the river, and Little Duck Creek, Duck Creek, Big Duck Creek, Mosquito Creek, and Beach Creek drain into the North Santee Bay. Cane Creek connects the North Santee River to the North Santee Bay and Bird Bank Creek enters the river just before it flows into the Atlantic Ocean.

Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: the South Santee River from its confluence with Collins Creek to the Atlantic Ocean including Collins Creek, Alligator Creek, the North Santee River from its confluence with the Wadmacon River to the North Santee Bay, Minim Creek, Kinloch Creek, the intracoastal waterway, North Santee Bay, and all the unnamed tributaries to the borders of the Santee Coastal Reserve. Additional natural resources in the watershed include the Francis Marion National Forest (covering the southeastern portion of the watershed), several wildlife management areas, the Yawkey Center, Hampton Plantation State Park, and numerous historic structures.

Water Quality

South Santee River - Aquatic life uses are fully supported, but may be threatened by elevated concentrations of heavy metals in sediments. A very high concentration of mercury was measured in the 1989 sediment sample, and a very high lead concentration was detected in the 1991 sediment sample. A high concentration of zinc was measured in the 1992 sediment sample, and a very high concentration of chromium, nickel, and lead were measured in the 1993 samples. In addition, an elevated concentration of chromium was measured in water in 1989. Significantly declining trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations, and turbidity suggest improving conditions. A significantly decreasing trend in pH was also detected. Recreational uses are fully supported. This river was Class B until April, 1992.

North Santee River - Aquatic life uses are only partially supported due to dissolved oxygen excursions, compounded by a statistically significant decreasing trend in pH. Since this is a secondary monitoring station, sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly declining trends in total phosphorus concentrations and turbidity suggest improving conditions. Recreational uses are fully supported. This river was Class B until April, 1992.

Shellfish Harvesting Status

All waters in this watershed are restricted to harvesting based on their potential for sustained elevated fecal coliform levels due to the Cooper River Rediversion project.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
NORTH SANTEE RIVER	SC0042439
GCW&SA NORTH SANTEE WWTF	MINOR MUNICIPAL
PIPE #: 001 FLOW: 0.052	EFFLUENT

Nonpoint Source Contributions

The South Santee River is included on the §319 list of waters impacted by agricultural activities. Water samples collected by the Department indicate elevated fecal coliform levels on numerous occasions. The South Santee River is also included on the §304(l) long list of waters impacted by nontoxic pollutants.

Growth Potential

There is a low potential for growth in this watershed.

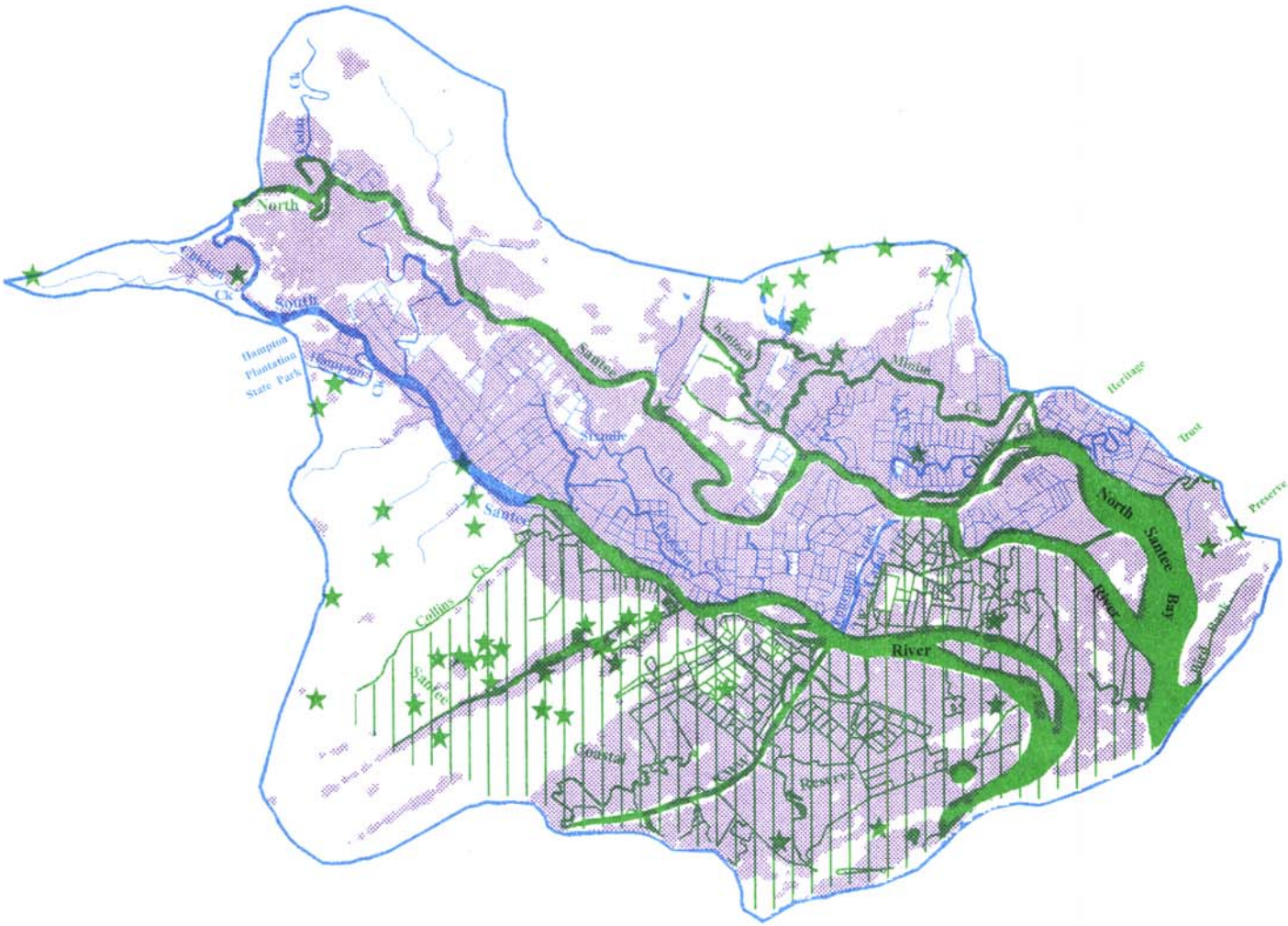
Implementation Strategy

Aquatic life uses for the North Santee River are impaired by low dissolved oxygen concentrations. This is a secondary station and the impairment may involve sampling bias. The station on the South Santee River gives identical data, but as a primary year-round station the seasonal bias is removed. The Department is currently re-evaluating the monitoring site locations in this basin to best utilize our resources. The South Santee River has a declining trend in dissolved oxygen concentrations due to unknown sources. An evaluation of this situation is ongoing.

Natural Resources

North and South Santee Rivers Watershed

(03050112-060)



Hydrography

Potential ORW Candidates

Wetlands

Endangered Species

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

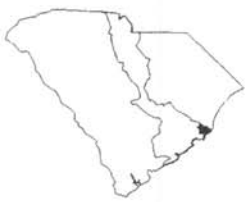
Water Quality Monitoring Stations

North and South Santee Rivers Watershed
(03050112-060)

Primary Stations

Secondary Stations

Hydrography



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

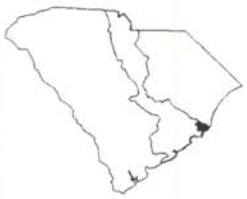
Activities Potentially Affecting Water Quality

North and South Santee Rivers Watershed

(03050112-060)

Municipal NPDES Discharges

Hydrography



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Watershed Evaluations and Implementation Strategies Within WMU-0303

Watershed Management Unit 0303 consists primarily of the ***Cooper River Basin***, the ***Ashley River Basin***, and a ***Coastal Basin***. This Management Unit originates in the Lower Coastal Plain and flows through the Coastal Zone region. There are a total of 15 watersheds and some 1 million acres in WMU-0301 of which 9.5% is urban land, 2.9% is agricultural land, 5.9% is scrub/shrub land, 0.4% is barren land, 50.0% is forested land, 9.6% is forested wetland, 9.5% is nonforested wetland, and 12.2% is water (SCLRCC 1990). The urban land percentage is comprised chiefly of Moncks Corner, Summerville, and the greater City of Charleston area. There are a total of 2,067.8 stream miles in WMU-0303, and 253.3 square miles of estuaries.

The Santee River is diverted into two directions in lower Lake Marion, it either is released from the Santee Dam or it is channeled along a 7.5 mile diversion canal to fill Lake Moultrie. The diverted Santee River leaves Lake Moultrie through the Pinopolis Dam and merges with Wadboo Swamp to form the Cooper River. The Cooper River flows into the West Branch Cooper River which merges with the East Branch Cooper River to reform the Cooper River. Downstream from the confluence, the Cooper River accepts drainage from the Back River, Goose Creek, and the Wando River before draining into the Charleston Harbor and the Atlantic Ocean. The Cypress Swamp drains into the Ashley River, which accepts drainage from several streams including Dorchester Creek before draining into the Charleston Harbor and the Atlantic Ocean. The intracoastal waterway is the primary stream running through the coastal basin. Awendaw Creek and the Stono River are the principal streams feeding this section of the intracoastal waterway, which drains into Bull Bay, Cape Romain Harbor, and numerous sounds and inlets that connect the coastal zone to the ocean.

Fish Consumption Advisory

A fish consumption advisory has been issued by SCDHEC for the East Branch of the Cooper River, the West Branch of the Cooper River, and the freshwater portions of the Cooper River, advising people to limit the amount of some types of fish consumed from these rivers and their tributaries due to mercury contamination. Pregnant women, infants, children, and people with neurologic diseases face the greatest risk of mercury related health problems and should not eat any fish from these waters. The fish consumption guidelines are based on diets of one type of fish only. If a person consumes several of the species listed for a stream, then the person should cut back even further on the amounts of each species consumed. For example, if a person eats three and three-quarter pounds of largemouth bass from the East Branch of the Cooper River, the person should not eat any bowfin from that river that month. The types of fish with mercury and the acceptable amounts of those fish that can be consumed are as follows: ***East Branch of the Cooper River*** (Largemouth bass - 3.75 lb./month, Bowfin - 4.75 lb./month); ***West Branch of the Cooper River and the Cooper River*** (Bowfin - 2.75 lb./month).

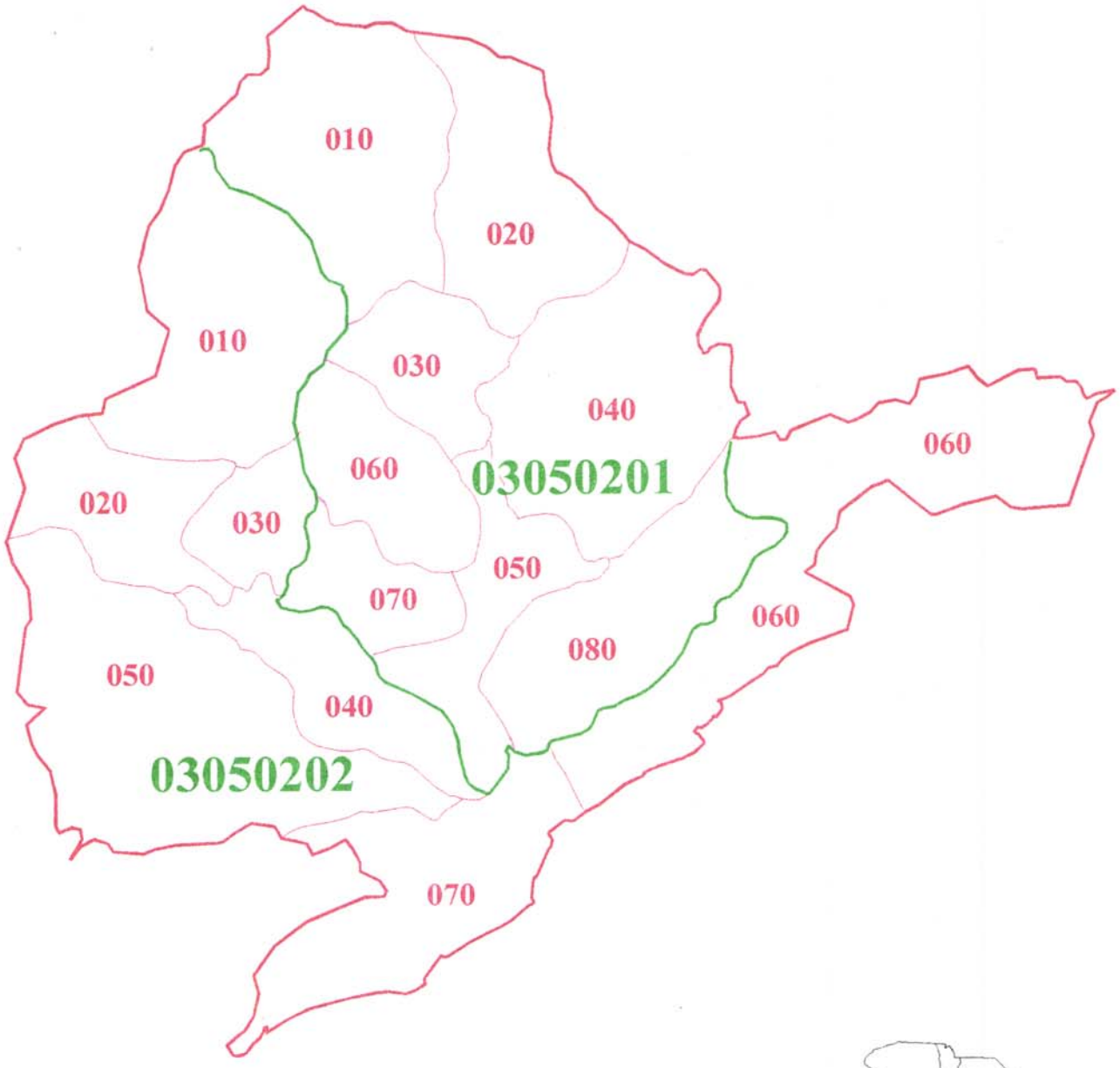
Mercury contamination in fish tissue is a rather recent phenomenon statewide, regionwide, nationwide, and worldwide. Scientific evidence suggests that mercury is being deposited on land and waterways from the atmosphere via rainfall. Sources of atmospheric mercury include the burning of coal, burning of medical and municipal wastes, lime manufacture, cloralkyli plants (makes chlorine and caustic soda), and cement kilns. Once the mercury is in freshwater, sulfur reducing bacteria convert it to methyl mercury which then is bioaccumulated in the food chain; ending up primarily in fish.

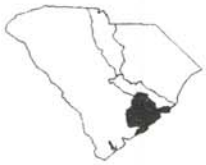
Climate

Normal yearly rainfall in the WMU-0303 area is 49.15 inches, according to the S.C. historic climatological record (SCWRC 1990). Data compiled from National Weather Service stations in Givhans Ferry State Park, Charleston Airport, Charleston, Sullivans Island, Summerville, and at the Pinopolis Dam were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the summer with 18.31 inches; 9.90, 9.96, and 11.08 inches of rain falling in the fall, winter, and spring, respectively. The average annual daily temperature is 64.8°F. Summer temperatures average 79.5°F and fall, winter, and spring temperatures are 66.4°F, 48.9°F, and 64.3°F, respectively.

Watershed Unit Index Map

Watershed Management Unit 0303



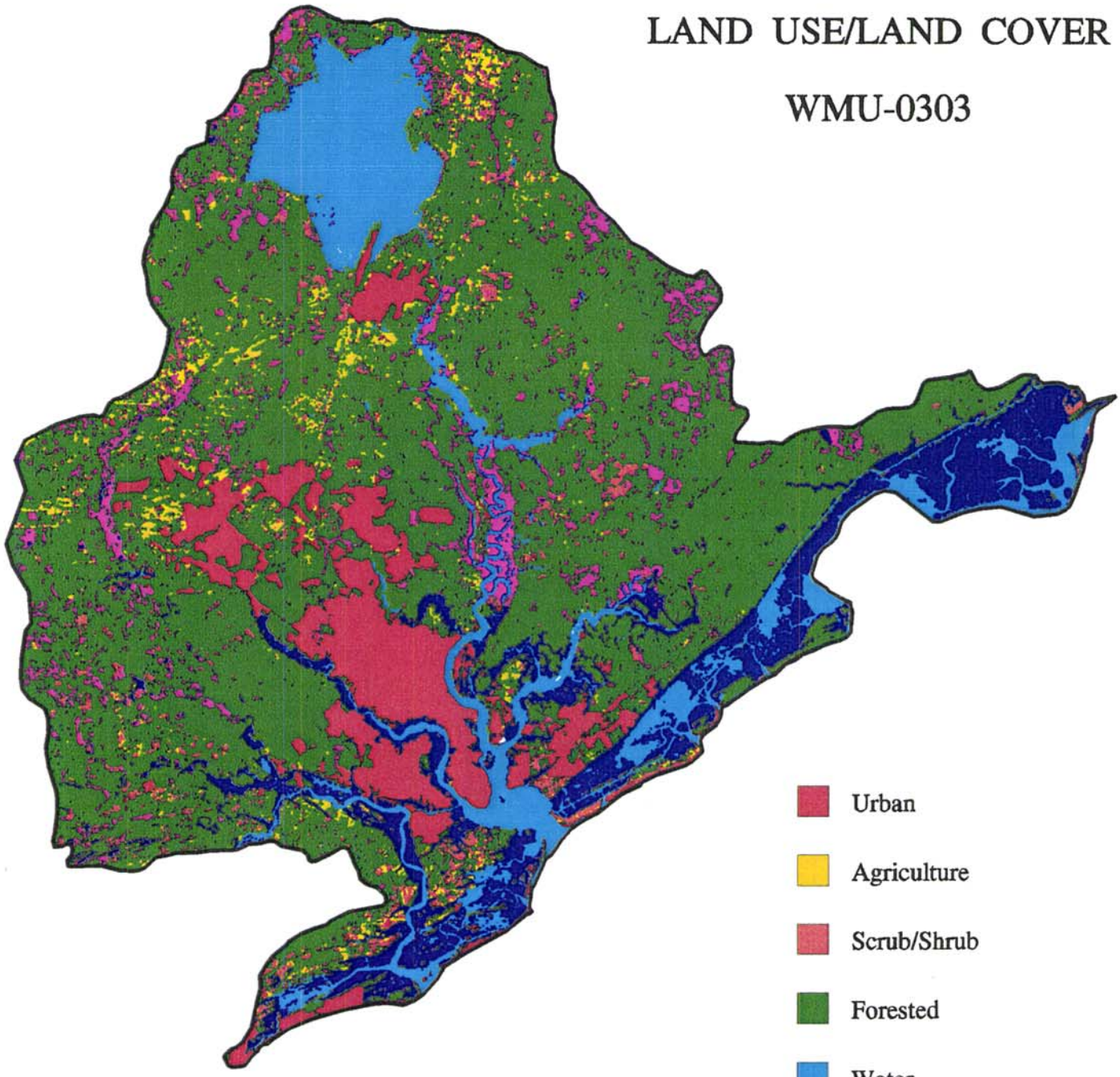


0 5 10 15 20 MILES

SCDHEC-EQC, 1995

LAND USE/LAND COVER

WMU-0303



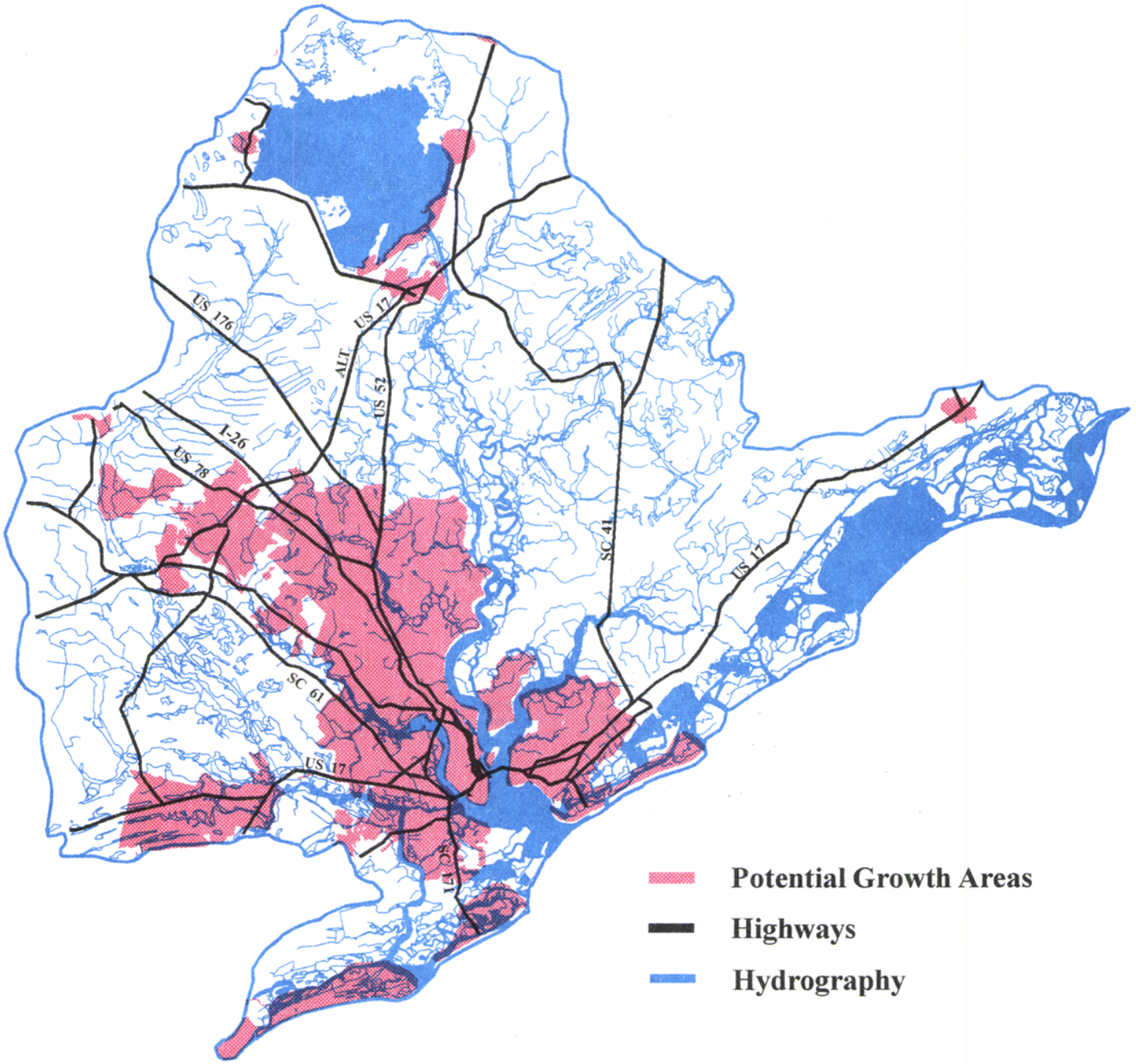
- Urban
- Agriculture
- Scrub/Shrub
- Forested
- Water
- Forested Wetlands
- Non-Forested Wetlands
- Barren/Disturbed

0 10 20 30 Miles

Source: Spot Satellite Imagery 89-90
SCDNR - LRC

Potential Growth Areas

Watershed Management Unit 0303



0 5 10 15 20 MILES

SCDHEC-EQC, 1995

03050201-010

(Lake Moultrie)

General Description

Watershed 03050201-010 is located in Berkeley County and consists primarily of ***Lake Moultrie*** and its tributaries. The watershed occupies 97,546 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Yauhannah-Yemassee-Rains-Lynchburg series. The erodibility of the soil (K) averages 0.17; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 2.73% urban land, 1.99% agricultural land, 5.03% scrub/shrub land, 0.94% barren land, 21.62% forested land, 8.60% forested wetland, and 59.09% water.

Lake Moultrie was created by diverting the Santee River (Lake Marion) through a 7.5 mile canal filling a levee-sided basin and impounding it with the Pinopolis Dam. Santee Cooper Public Service Authority oversees the operation of Lake Moultrie, which is used for power generation, recreation, and water supply. The 4.5 mile Tail Race Canal connects Lake Moultrie with the Cooper River near the Town of Moncks Corner, and the Rediversion Canal connects Lake Moultrie with the lower Santee River. Duck Pond Creek enters the lake on its western shore. The Tail Race Canal accepts the drainage of California Branch and the Old Santee Canal. There are a total of 131.4 stream miles in this watershed, all classified FW. Additional natural resources in the watershed include the Dennis Wildlife Center near the Town of Bonneau, Sandy Beach Water Fowl Area along the northern lakeshore, the Santee National Wildlife Refuge covering the lower half of the lake, and the Old Santee Canal State Park near Monks Corner.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0303).

Lake Moultrie - Categorized as a major lake, Lake Moultrie has a watershed covering 306.9 km^2 (up to the Lake Marion Dam), and a surface area of 24,443.5 hectares with a maximum and mean depth of 23.0m and 6.1m, respectively. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrients were nitrogen and phosphorus in the Russellville Flats (near the Rediversion Canal), and nitrogen near the diversion canal. Eutrophication studies classified Russellville Flats, midlake, diversion canal, and the dam of Lake Moultrie as Category III for the least eutrophic condition and preservation is recommended. The lake water quality trend data from 1980-1990 indicates that the waters at both the dam site and Russellville Flats area exhibited improvement over time. Hydropower generation, recreational uses, and domestic water supply have been impaired as a result of abundant aquatic macrophyte growth. The lake has been treated with aquatic herbicides every year for the past six years. Beginning in 1993, grass carp were introduced as an additional treatment to control the aquatic plants. The fish were introduced at Angels Landing

at a stocking rate of 15 fish/vegetated acre for a total of 50,000 fish. The Russellville Flats area was stocked in 1994 with 150,000 fish (15 fish/vegetated acre) in an effort to control the plants in this upper area of the lake. The SCPSA samples six sites within the main body of Lake Moultrie, and aquatic life and recreational uses are fully supported at these sites.

Tail Race Canal - Approximately the same location is sampled by both SCDHEC and SCPSA. Aquatic life uses are fully supported, but may be threatened by significantly decreasing trends in dissolved oxygen concentration and pH. A high concentration of zinc was measured in water in 1990. In the 1991 sediment sample, high concentrations of lead and zinc were measured. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations, and turbidity suggest improving conditions. Recreational uses are fully supported.

Old Santee State Park Swimming Lake - The lake has been treated with aquatic herbicides and stocked with *Tilapia* by the Water Resources Division of the SCDNR in an attempt to control aquatic macrophyte growth that has impaired the lake's recreational uses. *Tilapia* were stocked at a rate of 200 fish/vegetated acre, for a total of 3000 fish. The lake was treated again and restocked with 2,000 fish in 1994.

Duck Pond Creek - Aquatic life uses are not supported due to dissolved oxygen and pH excursions. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Lake Moultrie Tributary at southeast corner of Cross Generating Station - This site is sampled by SCPSA. Aquatic life uses are only partially supported due to dissolved oxygen excursions. Recreational uses are also only partially supported due to fecal coliform bacteria excursions.

Lake Moultrie Tributary - This site is sampled by SCPSA. Aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

Sanitary Bathing Areas

RECREATIONAL STREAM BATHING SITE	*PERMIT # STATUS*
LAKE MOULTRIE LIONS BEACH	08-01N ACTIVE
LAKE MOULTRIE SHORT STAY	NO PERMIT ACTIVE

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
DIVERSION CANAL SC PUBLIC SERV. AUTH./CROSS PIPE #: 003 FLOW: 0.079 PIPE #: 001,02A,02B,004 FLOW: M/R	SC0037401 MINOR INDUSTRIAL EFFLUENT
LAKE MOULTRIE US NAVY/SHORT STAY PIPE #: 001 FLOW: M/R	SC0024708 MINOR INDUSTRIAL EFFLUENT
LAKE MOULTRIE BERKELEY COUNTY/CROSS HIGH SCHOOL PIPE #: 001 FLOW: 0.0158	SC0027103 MINOR COMMUNITY EFFLUENT
LAKE MOULTRIE SANTEE COOPER AQUACULTURE PIPE #: 01A,01B,01C,002,003 FLOW: M/R	SC0046213 MINOR INDUSTRIAL EFFLUENT
TAIL RACE CANAL SC PUBLIC SERV. AUTH./JEFFERIES STEAM STA. PIPE #: 001 FLOW: 006 PIPE #: 002,003,004,006,007 FLOW: M/R	SC0001091 MAJOR INDUSTRIAL EFFLUENT
TAIL RACE CANAL C.R. BARD, INC. PIPE #: 001 FLOW: 0.3820	SC0035190 MAJOR INDUSTRIAL EFFLUENT
DUCK POND CREEK BERKELEY COUNTY/CROSS ELEM SCHOOL PIPE #: 001 FLOW: 0.0150 WQL FOR BOD5, NH3-N, DO	SC0034479 MINOR COMMUNITY WATER QUALITY

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
SC PUBLIC SERV. AUTH. INDUSTRIAL	IWP-186 ACTIVE
SC PUBLIC SERV. AUTH. INDUSTRIAL	IWP-185 ACTIVE
SC PUBLIC SERV. AUTH. CONSTRUCTION	CWP-034 ACTIVE
RUSSELLVILLE CONSTRUCTION	CWP-026 ACTIVE

Mining Activities

MINING COMPANY / *MINE NAME*	*PERMIT #* / *MINERAL*
CDS INVESTMENTS	0698-08
SANTEE CIRCLE FARMS MINE	SAND

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
GEORGIA-PACIFIC CORP. (I)	LAKE MOULTRIE	0.43
C.R. BARD, INC. (I)	TAIL RACE CANAL	1.44
SANTEE COOPER REG.WTR.AUTH. (M)	LAKE MOULTRIE	9.53

Growth Potential

There is a moderate potential for growth in this watershed. Lake Moultrie contributes significantly to the growth in the area in terms of fishery tourism and residential development. The Towns of Monk Corner, Cross, and Bonneau should benefit from the lake-based growth. Monks Corner provides both water and sewer services and may encourage future growth. The Pinopolis peninsula has low density residential, including several historic structures, and a Santee Cooper semi-private recreation/conference center. There is a regional domestic water supply system on Lake Moultrie near Lions Beach (water withdrawn from Pinopolis cove) that serves Berkeley County Water and Sewer Authority, Moncks Corner, Goose Creek, and Summerville Public Service Area.

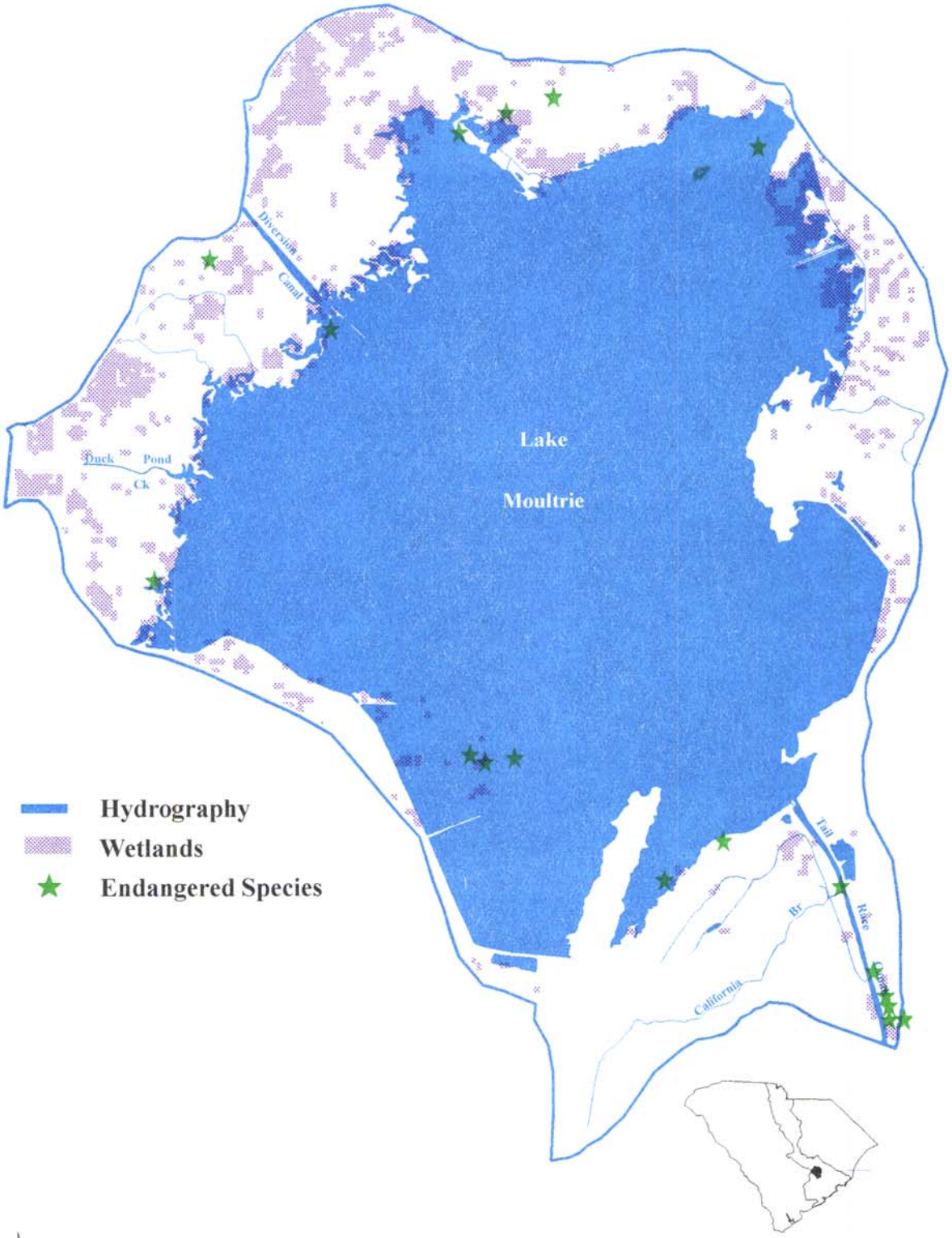
Implementation Strategy

Aquatic life and recreational uses for tributaries of Lake Moultrie are impaired by low dissolved oxygen and elevated fecal coliform bacteria concentrations from unknown sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. Both aquatic life and recreational uses for Duck Pond Creek are impaired by low dissolved oxygen and elevated bacterial conditions due to point sources. The system was upgraded and the impairments are expected to improve. The Tail Race Canal has declining trends in pH and dissolved oxygen concentrations due to unknown sources. An evaluation of these situations is ongoing.

The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

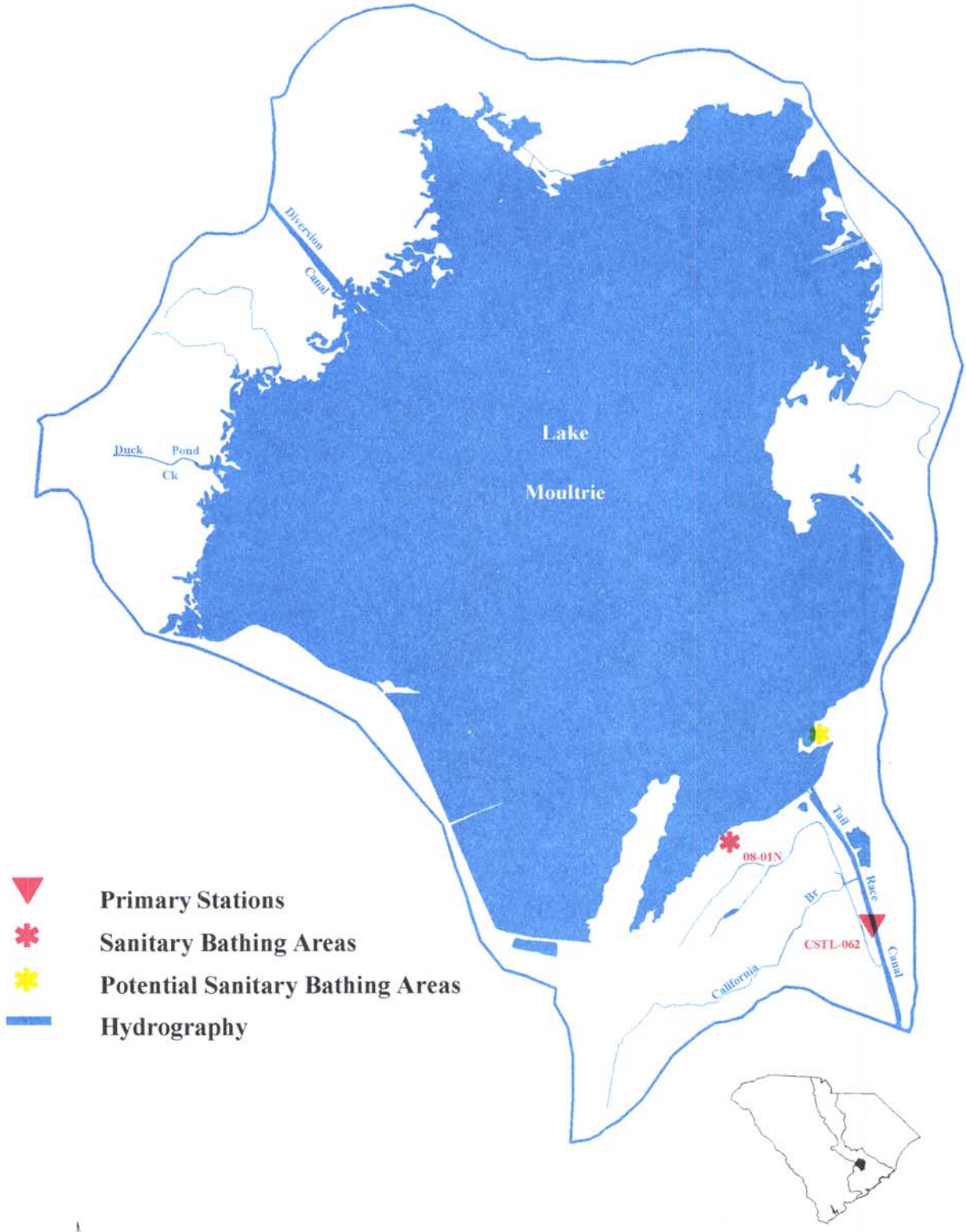
Lake Moultrie Watershed
(03050201-010)



SCDHEC-EQC, 1995

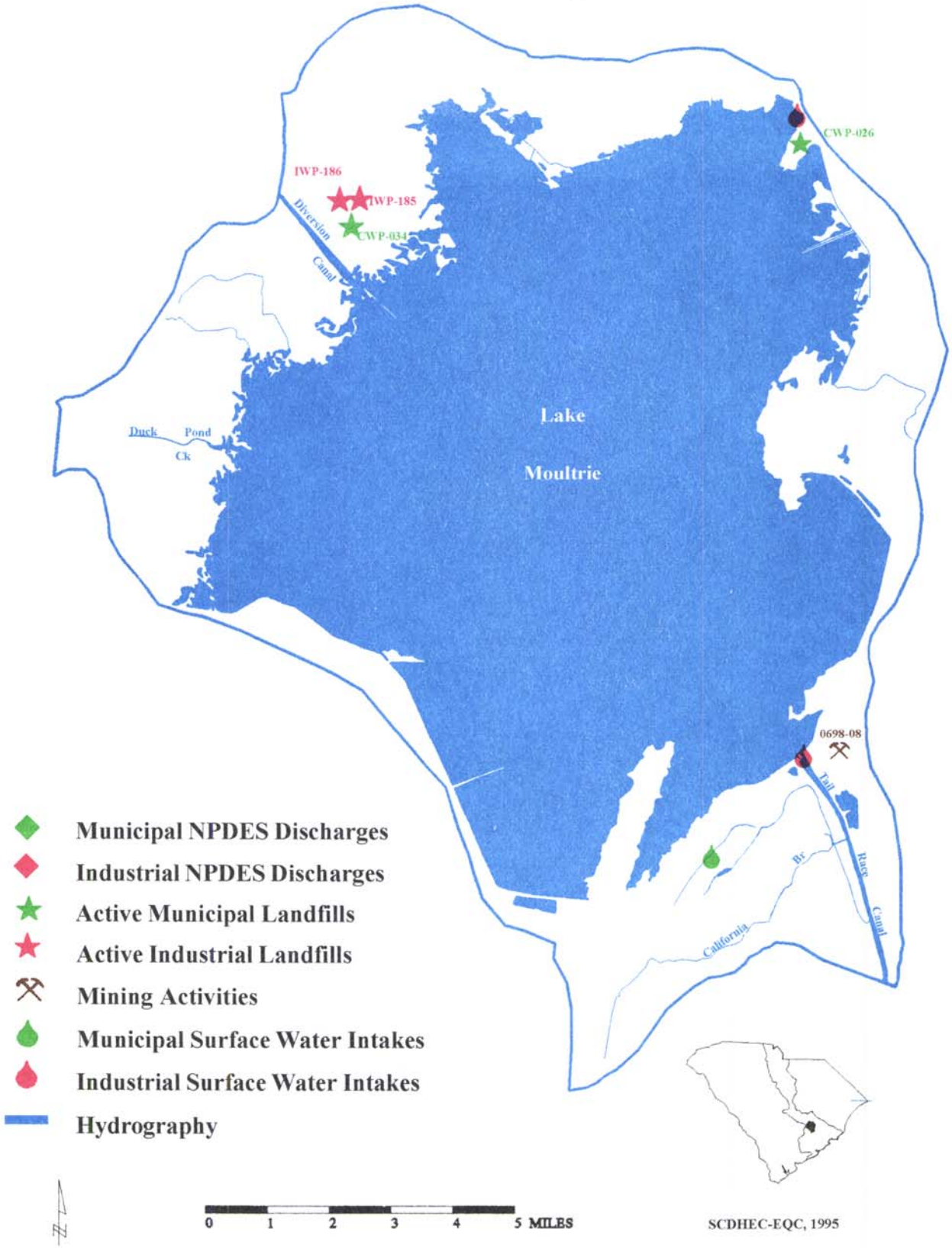
Water Quality Monitoring Stations

Lake Moultrie Watershed
(03050201-010)



Activities Potentially Affecting Water Quality

Lake Moultrie Watershed
(03050201-010)



03050201-020

(Wadboo Swamp)

General Description

Watershed 03050201-020 is located in Berkeley County and consists primarily of ***Wadboo Swamp*** and its tributaries. The watershed occupies 71,821 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Bladen-Wahee-Hobcaw-Mouzon-Chipley series. The erodibility of the soil (K) averages 0.17; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 0.04% urban land, 5.37% agricultural land, 7.87% scrub/shrub land, 0.58% barren land, 74.91% forested land, 10.80% forested wetland, and 0.43% water.

Wadboo Swamp originates near the Town of St. Stephen and merges with the Tail Race Canal to form the Cooper River. Gravel Hill Swamp accepts the drainage of Walker Swamp (Halfway Swamp) then flows into Wadboo Swamp followed by Rice Hope Swamp, Stewart Creek, Whiskenboo Creek (Cane Pond Branch), Cane Gully Branch (Graveyard Lead, Peters Swamp, Callum Branch), Bullhead Run (Mary Anne Branch), and Broad Ax Branch (Canady Branch, Mingo Branch). Wadboo Swamp becomes Wadboo Creek downstream of Broad Ax Branch. Walleye Bay, located at the headwaters of Whiskinboo Creek and Cane Gully Branch accepts drainage from Big Ocean Bay, Whitten Bay, and Boggy Swamp. Little Ocean Bay, Graveyard Bay, Huckleberry Bay, and Mill Bay drain into Peters Swamp. There are a total of 172.3 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Walleye Bay, Peters Swamp, Graveyard Bay, Mill Bay, Little Ocean Bay, Whitten Bay, Big Ocean Bay, Boggy Swamp, Graveyard Lead, Huckleberry Bay, and portions of Cane Gully Branch. Another natural resource is the Francis Marion National Forest, which extends across the entire watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0303).

Wadboo Swamp - Aquatic life uses are fully supported. Although dissolved oxygen excursions occurred, this creek is a typical swamp drainage, and ceases to flow and stagnates in the summer months. This is considered to be a natural condition, not a standards violation. Recreational uses are only partially supported due to fecal coliform bacteria excursions under Class FW standards. This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed.

Walker Swamp - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity. Although dissolved oxygen excursions occurred, this creek is a typical

swamp drainage, and ceases to flow and stagnates in the summer months. This is considered to be a natural condition, not a standards violation. P,P'DDE, a metabolite of DDT, was detected in the 1991 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards. This creek was Class B until April, 1992.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
HALFWAY SWAMP GA PACIFIC/RUSSELLVILLE PIPE #: 001 FLOW: 0.9050 PIPE #: 001A,001B,002 FLOW:M/R WETLAND; WQL FOR BOD_5, TRC, NH3-N, DO	SC0003115 MINOR INDUSTRIAL WATER QUALITY
WADBOO SWAMP MACEDONIA ELEM & HIGH PIPE #: 001 FLOW: 0.0298 WQL FOR BOD_5, TRC, NH3-N, DO	SC0027090 MINOR COMMUNITY WATER QUALITY
WADBOO SWAMP TRIB BERKELEY COUNTY SCHOOL DISTRICT PIPE #: 001 FLOW: 0.0200 WETLAND	PROPOSED MINOR COMMUNITY WATER QUALITY

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WARE BROTHERS, INC. FONDREN EARTH EXCAVATION	0817-08 SAND/GRAVEL

Growth Potential

There is a low potential for growth in this watershed, which contains the Town of Bonneau and the communities of Macedonia and portions of Russellville. A large portion of the watershed is contained within the Francis Marion National Forest.

Implementation Strategy

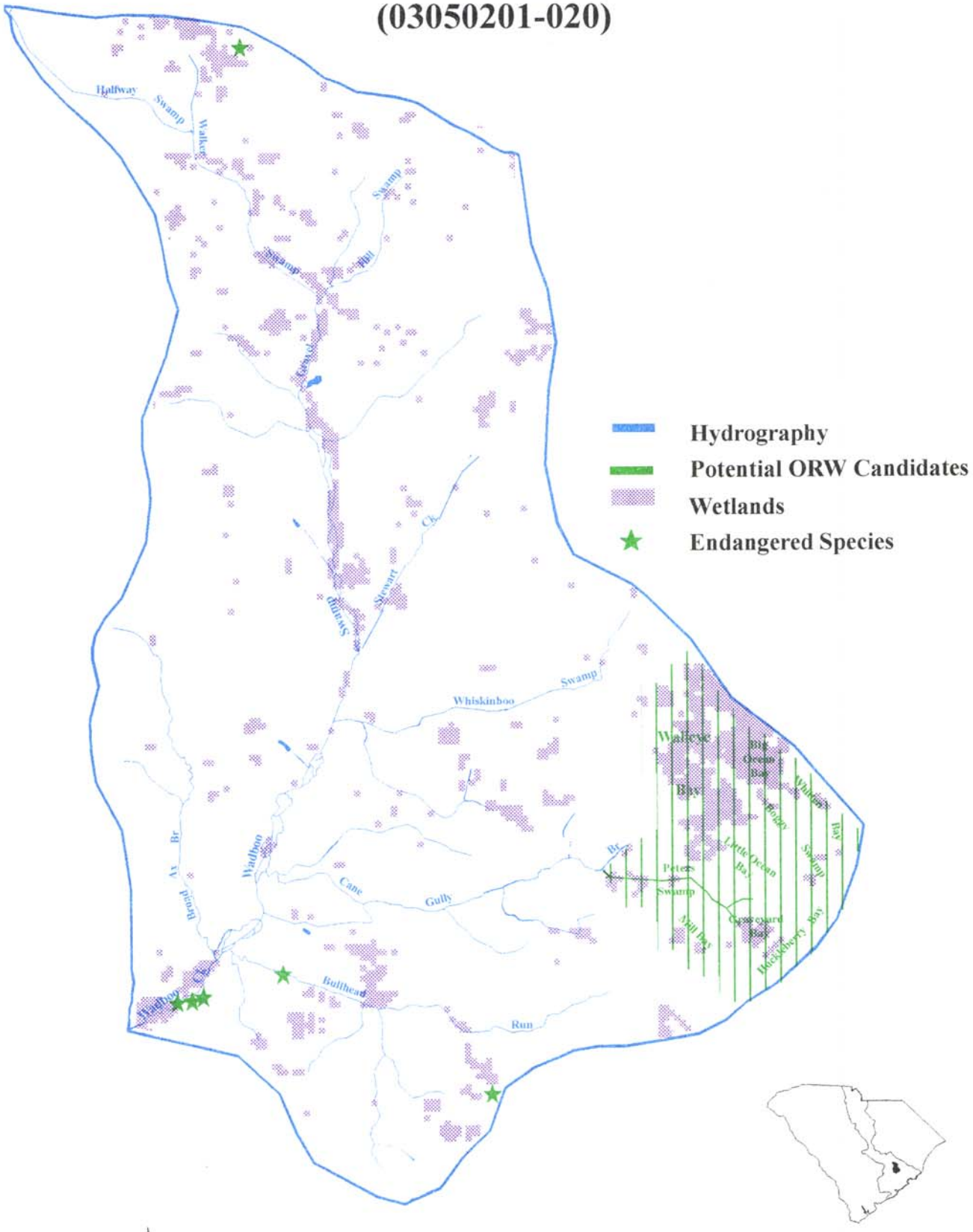
Recreational uses for Wadboo Swamp and Walker Swamp are impaired by elevated fecal coliform bacteria concentrations. Wadboo Swamp's bacterial condition is primarily point source related. The permit for this discharger is being revised and the bacterial condition is expected to

improve with the new NPDES permit limits. Walker Swamp's impairment results from nonpoint sources and low flow conditions. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Wadboo Swamp Watershed

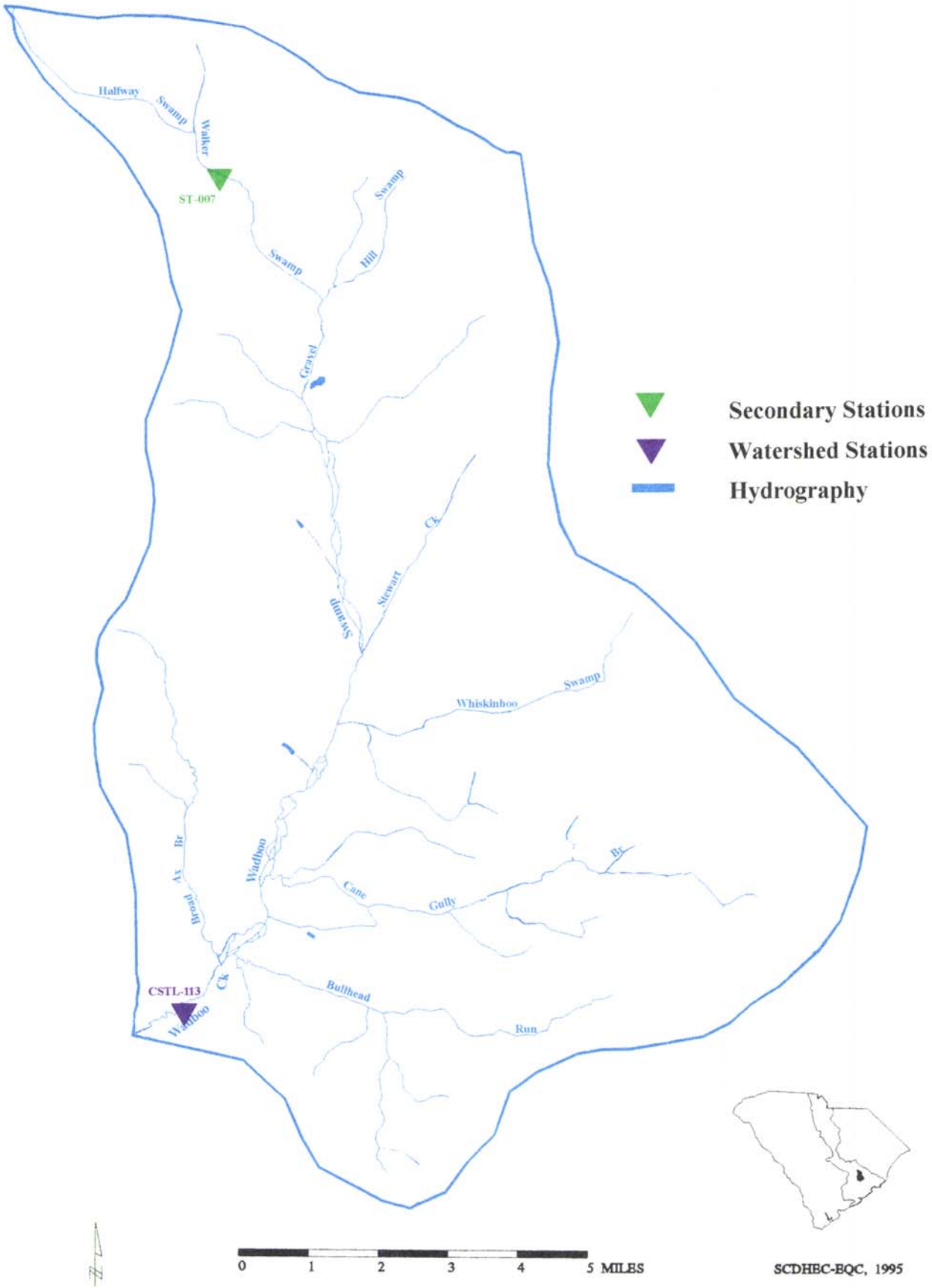
(03050201-020)



Water Quality Monitoring Stations

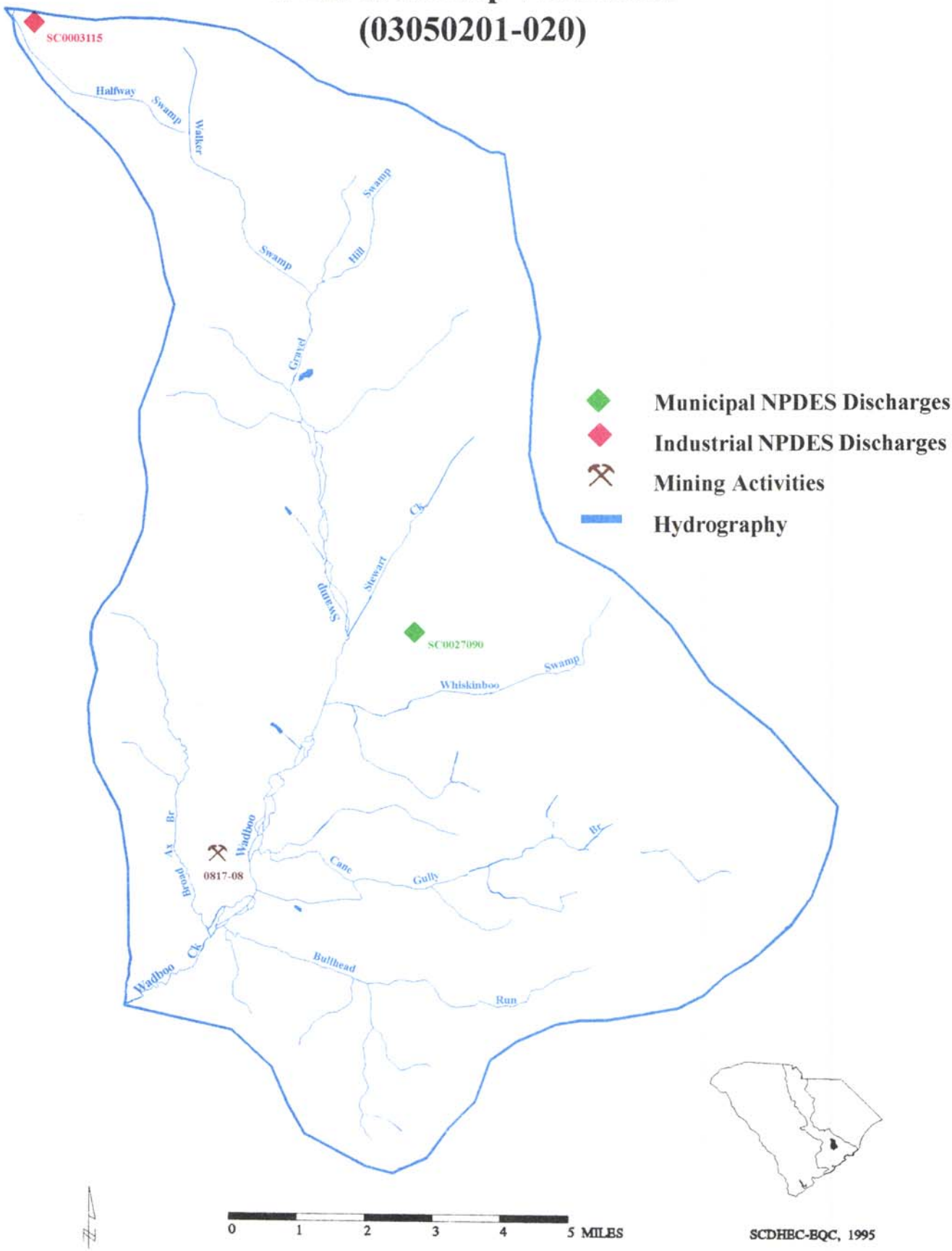
Wadboo Swamp Watershed

(03050201-020)



Activities Potentially Affecting Water Quality

Wadboo Swamp Watershed
(03050201-020)



03050201-030

(Cooper River/West Branch Cooper River)

General Description

Watershed 03050201-030 is located in Berkeley County and consists primarily of the ***Cooper River and the West Branch Cooper River*** and their tributaries. The watershed occupies 45,042 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Bladen-Bohicket-Wahee-Chipley series. The erodibility of the soil (K) averages 0.14; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 9.52% urban land, 5.76% agricultural land, 2.94% scrub/shrub land, 0.37% barren land, 58.17% forested land, 11.55% forested wetland, 0.96% nonforested wetland, and 10.73% water.

The Cooper River is formed by the confluence of Lake Moultrie (Tail Race Canal) and Wadboo Swamp. The West Branch Cooper River is formed from the confluence of the Cooper River and Mepkin Creek. The West Branch Cooper River accepts drainage from Molly Branch (Stony Branch, Wappoola Swamp) and Durham Creek (Durham Canal). The West Branch Cooper River drains into the Back River watershed (03050201-060) via Durham Creek and the Cooper River. There are a few recreational ponds (10-60 acres) and a total of 166.6 stream miles in this watershed, all classified FW. There also are numerous historic structures in the watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0303).

West Branch Cooper River - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in pH. In the 1992 sediment sample, an extremely high concentration of lead was measured. P,P'DDT was detected in the 1989 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. Recreational uses are fully supported.

Durham Creek - Aquatic life and recreational uses are fully supported. Although dissolved oxygen excursions occurred, they were typical of values seen in blackwater systems and were considered natural, not standards violations. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
WAPOOLA SWAMP SCE&G/WILLIAMS ASH PILE PIPE #: 001 FLOW: M/R UNCONSTRUCTED	SC0046175 MINOR INDUSTRIAL EFFLUENT
WAPOOLA SWAMP SCE&G/WILLIAMS LANDFILL PIPE #: 001 FLOW: 0.033	SC0039535 MINOR INDUSTRIAL EFFLUENT
WEST BRANCH COOPER RIVER TOWN OF MONCKS CORNER PIPE #: 001 FLOW: 2.4 WQL FOR NH3-N	SC0021598 MAJOR MUNICIPAL WATER QUALITY
WEST BRANCH COOPER RIVER BCW&SA/CENTRAL BERKELEY PLT PIPE #: 001 FLOW: 1.0	SC0039764 MINOR MUNICIPAL EFFLUENT

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
SCE&G INDUSTRIAL	IWP-191 ACTIVE
NEIGHBORS SITE MUNICIPAL	DWP-073 CLOSED
BERKELEY COUNTY MUNICIPAL	DWP-105 ACTIVE
BERKELEY COUNTY MUNICIPAL	DWP-073 CLOSED

Growth Potential

Future growth is expected in several areas within the watershed, including the Town of Monks Corner, the Whitesville and Pimlico Communities, and the Berkeley Country Club area. The Town of Monks Corner and Berkeley County operate water and sewer systems in the area, which may allow scattered development.

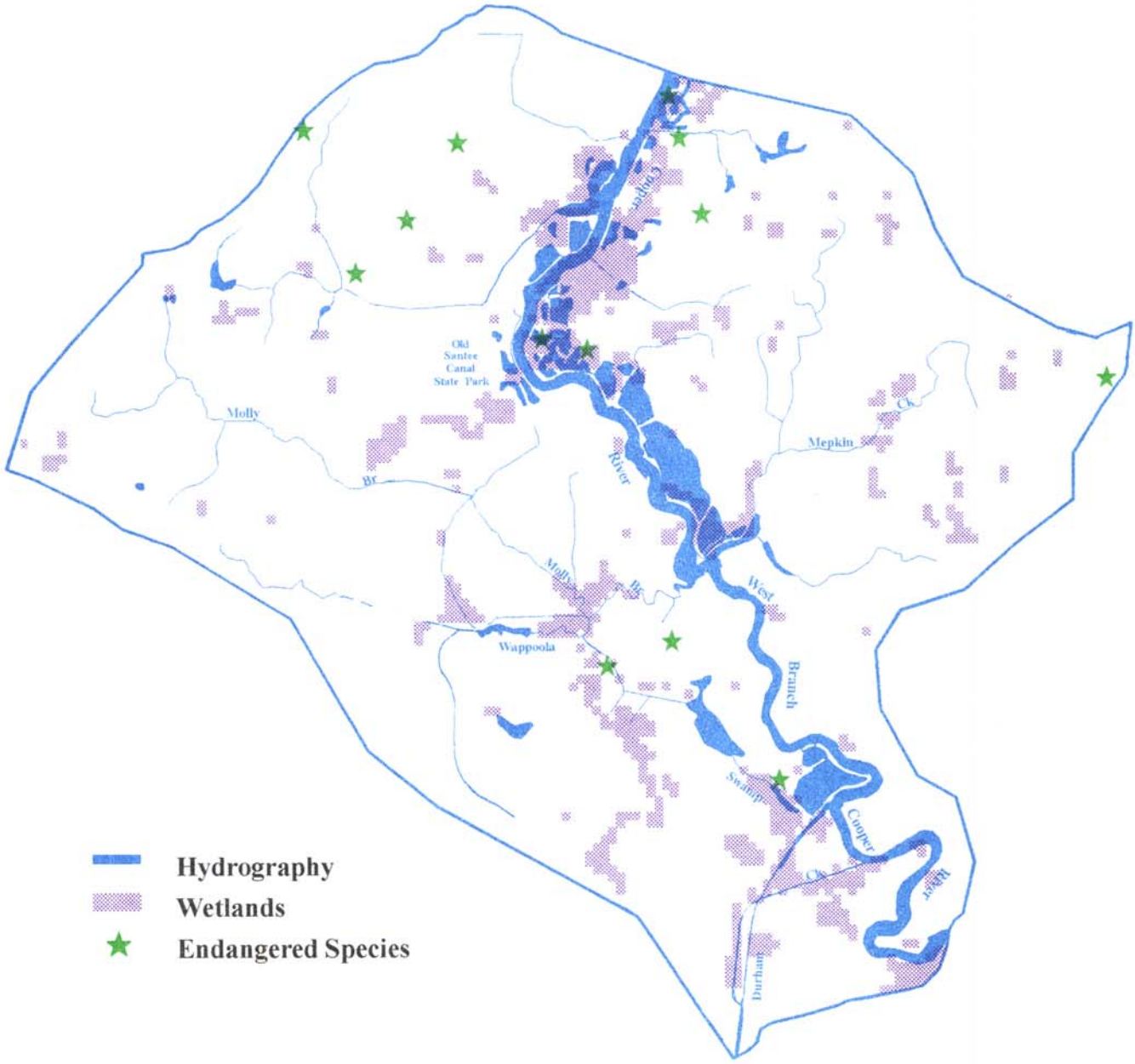
Implementation Strategy

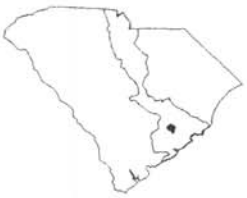
The West Branch Cooper River has a declining trend in pH due to unknown sources. An evaluation of this situation is ongoing. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

West Branch Cooper River Watershed

(03050201-030)



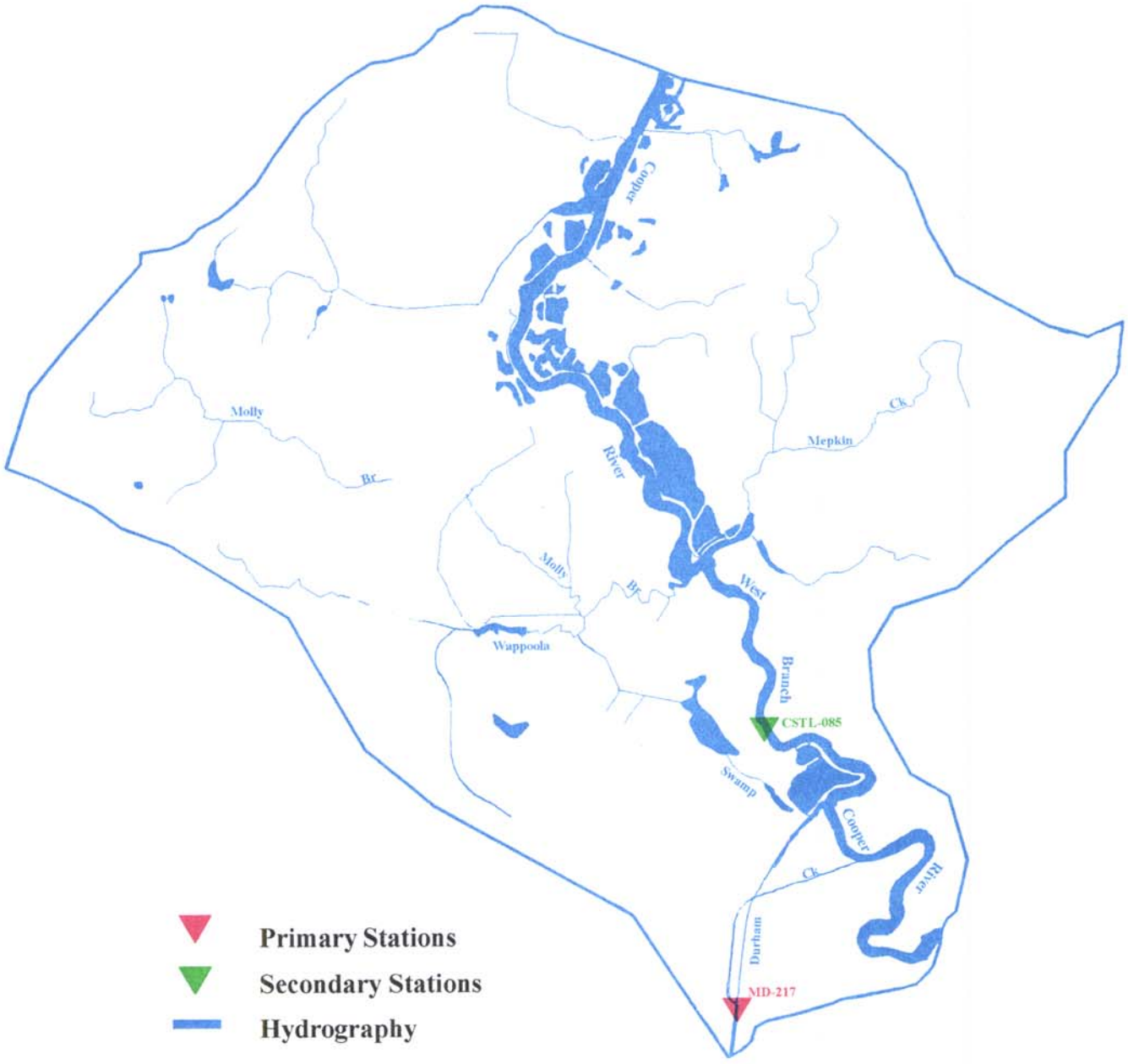


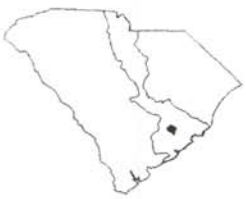
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

West Branch Cooper River Watershed
(03050201-030)





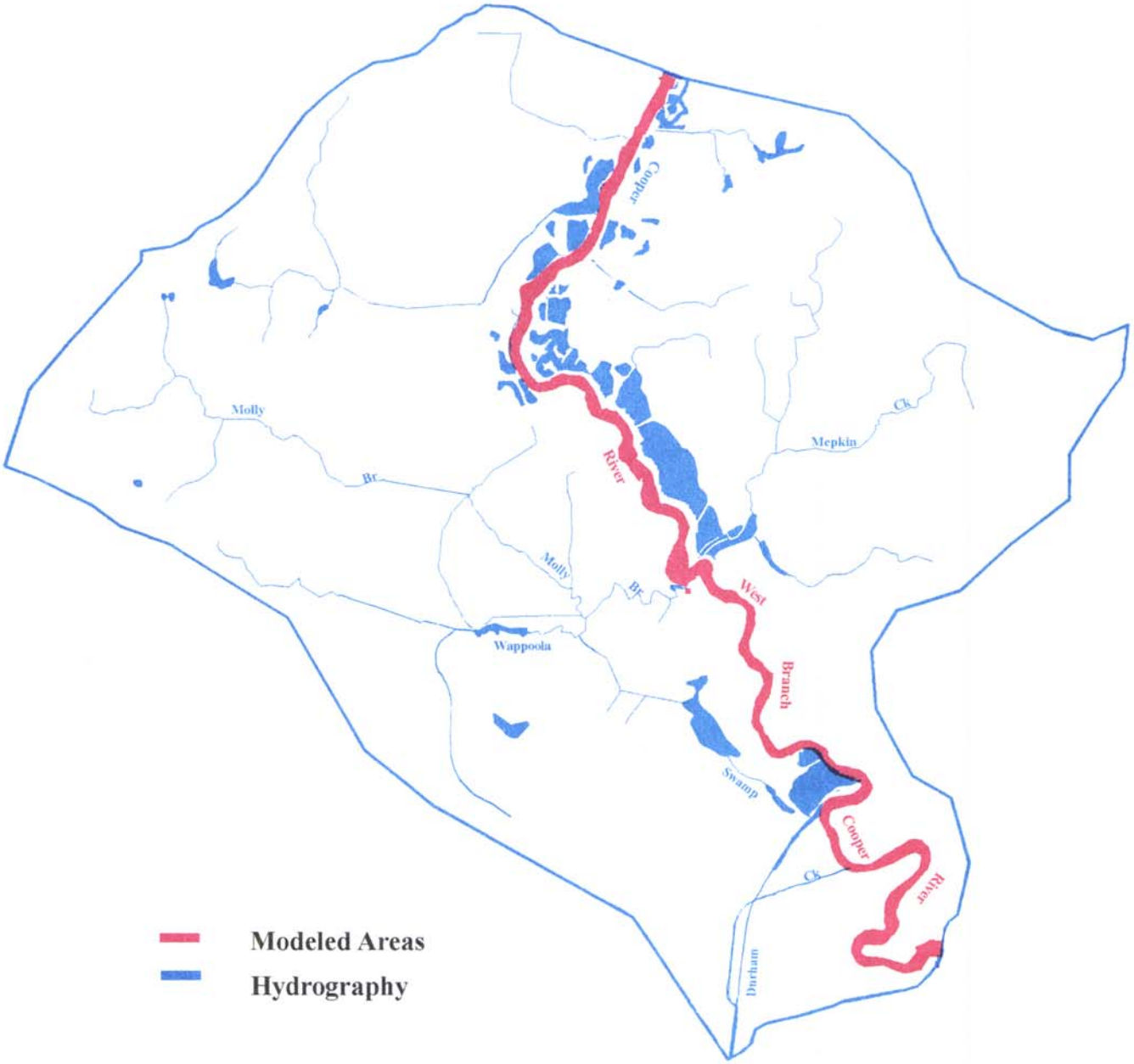
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

West Branch Cooper River Watershed

(03050201-030)

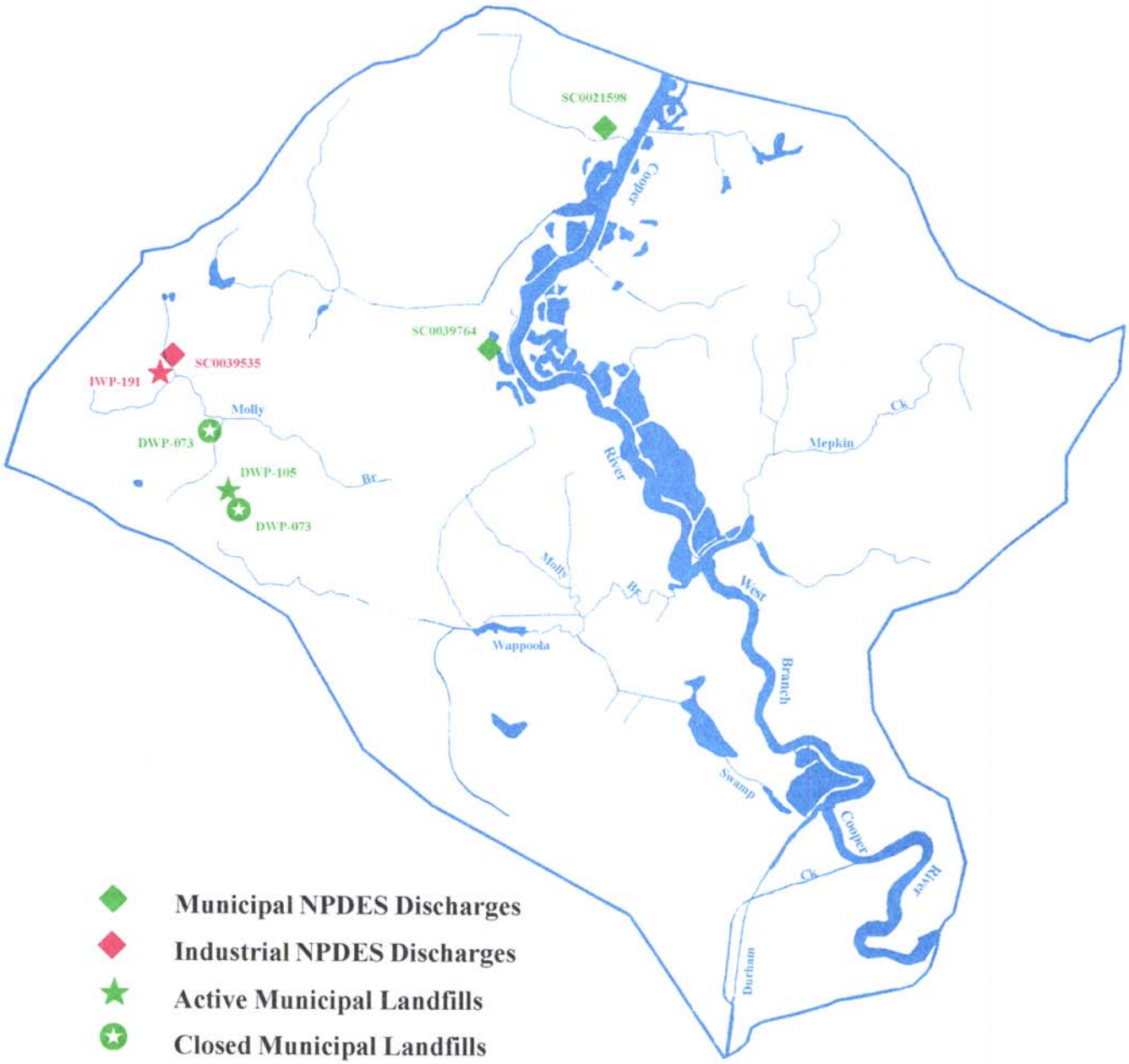


0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

West Branch Cooper River Watershed
(03050201-030)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Active Municipal Landfills
- Closed Municipal Landfills
- Active Industrial Landfills
- Hydrography

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050201-040

(East Branch Cooper River)

General Description

Watershed 03050201-040 is located in Berkeley and Charleston Counties and consists primarily of the ***East Branch Cooper River*** and its tributaries. The watershed occupies 103,801 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Yauhannah-Yemassee-Chipley-Hobcaw series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 0.00% urban land, 0.67% agricultural land, 4.06% scrub/shrub land, 0.02% barren land, 77.28% forested land, 15.21% forested wetland, 0.18% nonforested wetland, and 2.58% water.

The East Branch Cooper River is formed by the confluence of Huger Creek and Quinby Creek. Prior to the confluence, Huger Creek accepts drainage from Nicholson Creek (Kutz Creek, Darlington Creek, Darlington Swamp, Cooks Creek, Jericho Branch, Fourth of July Branch), Turkey Creek (Huitt Branch, Old Man Lead, Oakie Branch, Muddy Creek, Fox Gully Branch), Negro Field Branch, and Gough Creek (Alligator Creek, Midway Reserve, Little Hellhole Reserve, Little Hellhole Bay, Quarterman Branch, Upper Reserve, Lower Reserve). Quinby Creek accepts drainage from Harleston Dam Creek (Cropnel Dan Creek), Northampton Creek, Bennett Branch, Deep Branch, Pinckney Reserve Branch, Menzer Run, and York Bottom Creek. Bennett Branch flows through a 50-acre recreational pond, and the Hester Canal bypasses Quinby Creek near its mouth. The entire area prior to the confluence of Huger and Quinby Creeks is within the Francis Marion National Forest.

Downstream of the confluence, the East Branch Cooper River receives drainage from Mayrant Lead, French Quarter Creek (Chipper Swamp, Freshing Lead), and Big Dam Lead (Comingtee Creek). There are several recreational ponds and lakes in the watershed (10-150 acres), and a total of 409.4 stream miles, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Jericho Swamp, Boggy Head Bay, Boar Bay, Midway Reserve, Little Hellhole Bay, Alligator Creek, Nicholson Creek, Cooks Creek, Kutz Creek, Darlington Creek, Darlington Swamp, Jericho Branch, Turkey Creek, and Huit Branch.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0303).

East Branch Cooper River - Due to the inaccessibility of this creek, no water quality data are available. The creek is best characterized as a typical coastal plains stream.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
EAST BRANCH COOPER RIVER CAROLINA LOWCOUNTRY GS COUNCIL PIPE #: 001 FLOW: 0.012	SC0033073 MINOR COMMUNITY EFFLUENT
FRENCH QUARTER CREEK CAINHOY ELEMENTARY SCHOOL PIPE #: 001 FLOW: 0.020 WQL FOR DO	SC0037621 MINOR COMMUNITY WATER QUALITY

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
FRENCH QUARTER GROUP LP FRENCH QUARTER MINE	0873-08 SAND/CLAY

Growth Potential

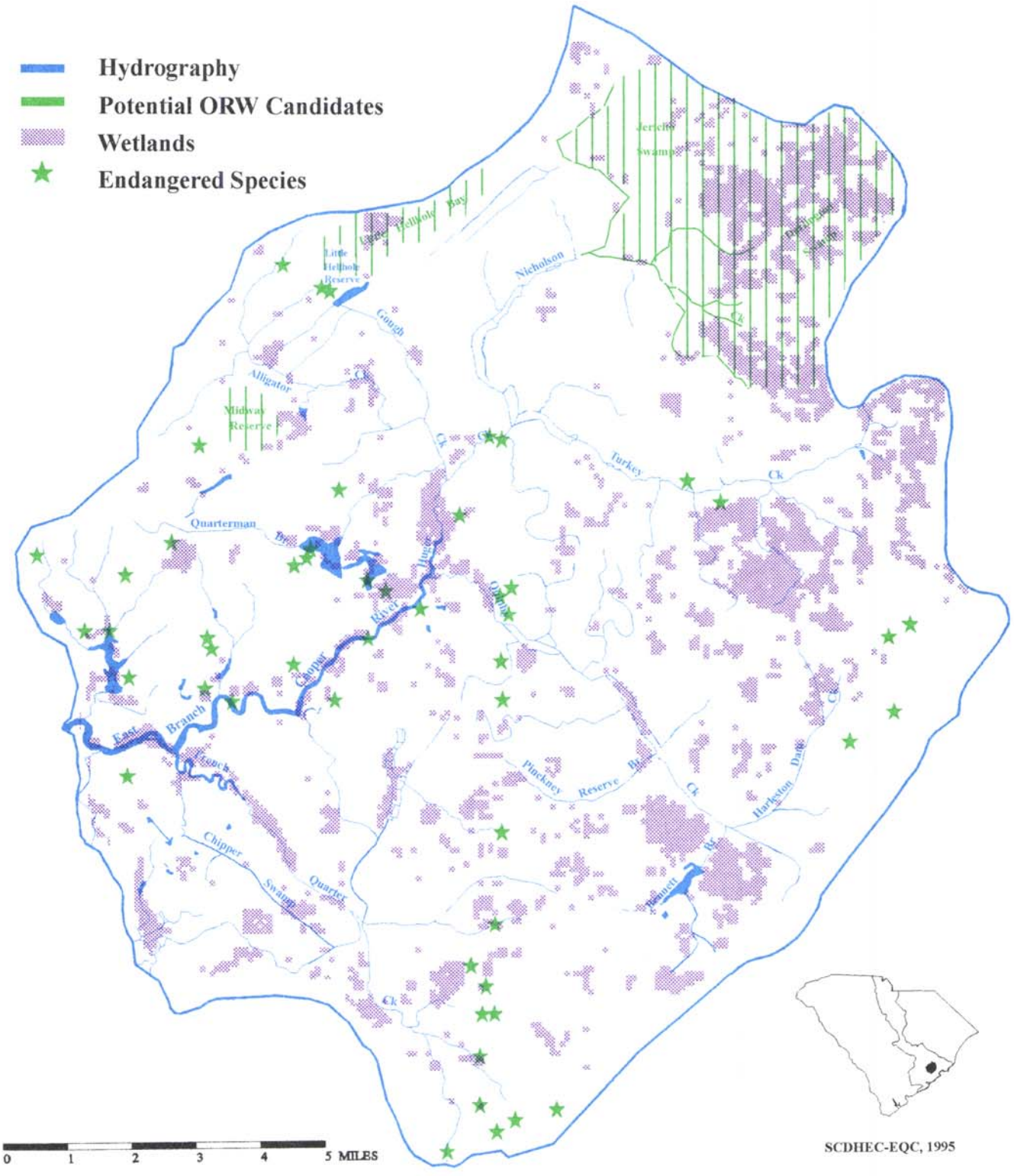
There is a low potential for growth expected in this watershed. There are numerous historic structures located in the area, and great public sentiment to preserve the historic character of the area.

Implementation Strategy

The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

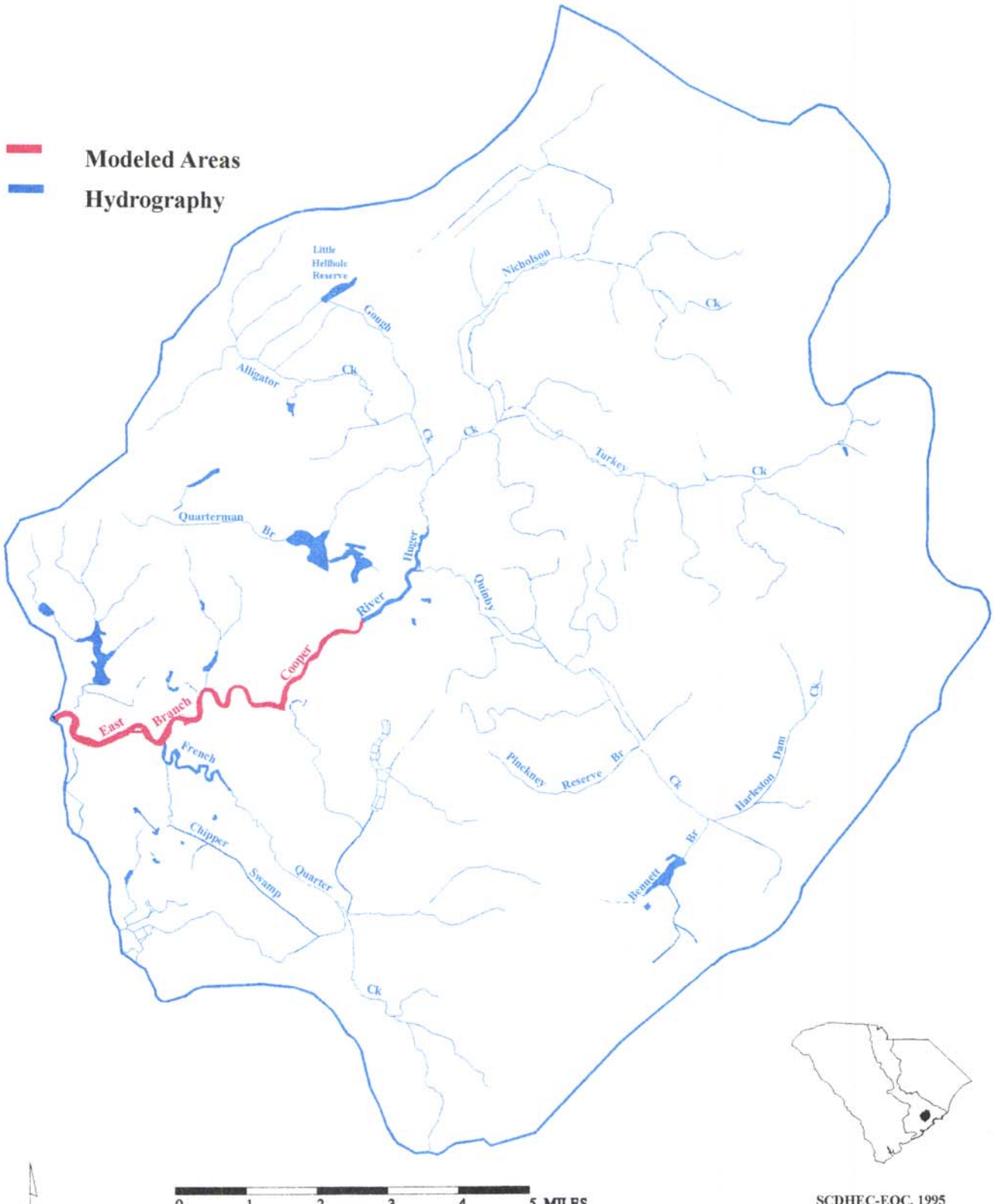
East Branch Cooper River Watershed
(03050201-040)



SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

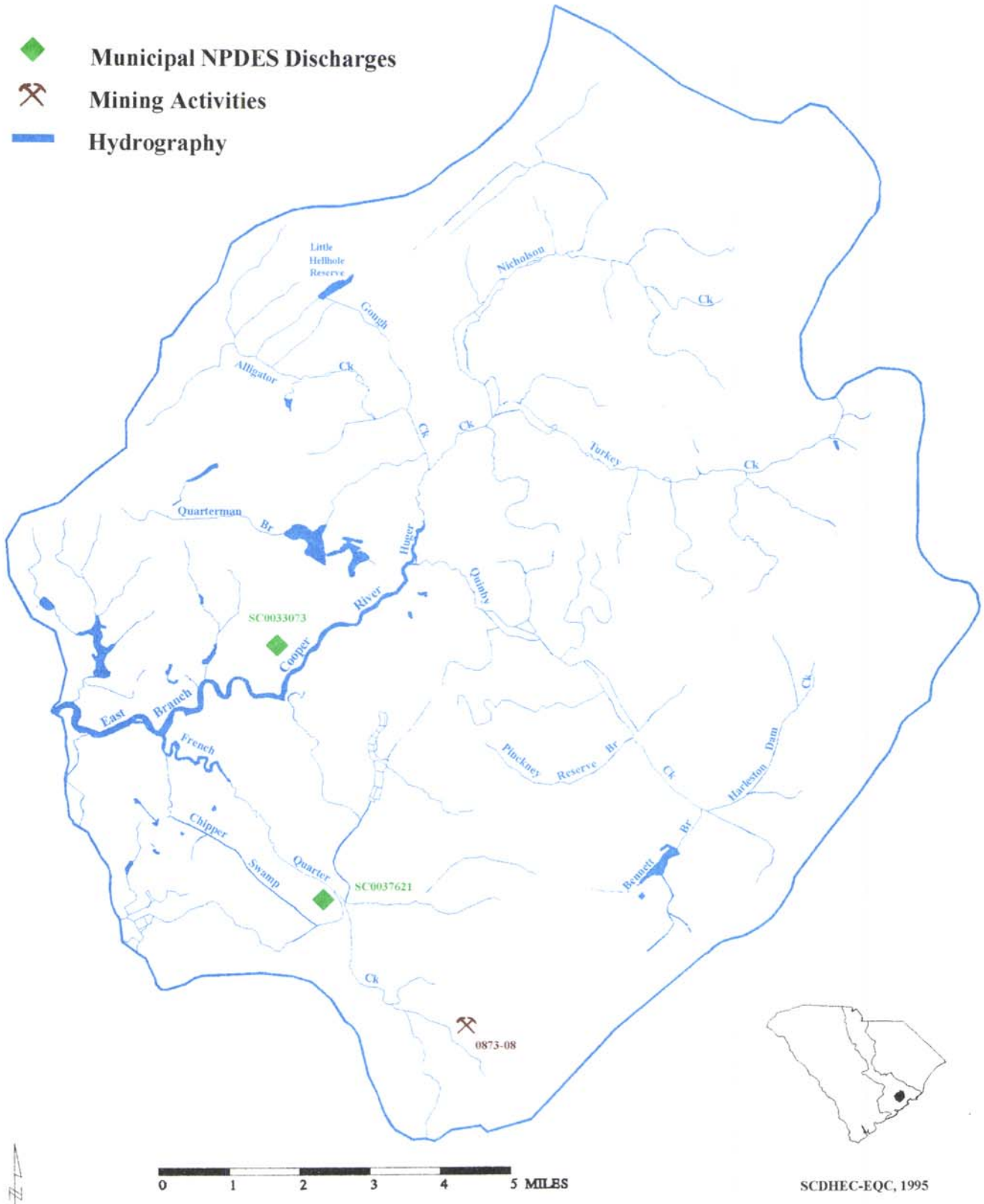
East Branch Cooper River Watershed
(03050201-040)



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

East Branch Cooper River Watershed
(03050201-040)



03050201-050

(Cooper River)

General Description

Watershed 03050201-050 is located in Berkeley and Charleston Counties and consists primarily of the ***Cooper River*** and its tributaries. The watershed occupies 55,634 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Bohicket-Chipley-Leon-Capers series. The erodibility of the soil (K) averages 0.17; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 26.64% urban land, 1.01% agricultural land, 3.70% scrub/shrub land, 0.65% barren land, 27.73% forested land, 4.04% forested wetland, 16.07% nonforested wetland, and 20.16% water.

The Cooper River is formed at "The Tee" by the confluence of the West Branch Cooper River and the East Branch Cooper River and flows past the City of Charleston and into the Charleston Harbor. The river is classified SB downstream from The Tee area. En route to the Charleston Harbor, the Cooper River accepts drainage from Tidal Creek, Grove Creek (Little Johnson Creek), the Back River watershed (03050201-060), Flag Creek (Pepper Gully), Slack Reach, Yellow House Creek, the Goose Creek watershed (03050201-070), Filbin Creek, Noisette Creek, Clouter Creek, Shipyard Creek, Newmarket Creek, and the Wando River watershed (03050201-080). There are several recreational ponds (10-40 acres) in the watershed. There are a total of 58.8 stream miles, and 17.2 square miles of estuarine areas. Other natural resources in this watershed include the Francis Marion National Forest near the Flag Creek headwaters and Cypress Gardens.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0303).

Cooper River - The reduction in freshwater input to the river due to the Cooper River Rediversion Project has resulted in changes in the hydrologic characteristics of the river and may be responsible in part for some of the long term changes observed in water quality parameters. The Cooper River has been treated annually in the past six years with aquatic herbicides in an attempt to control the growth of aquatic macrophytes. The plants need to be reduced in high use areas and trails need to be accessed from the ricefields to open water. Cypress Gardens was treated with aquatic herbicides in 1992 to provide boating access and improve aesthetics.

There are seven SCDHEC monitoring sites along this section of the Cooper River. The freshwater portion of the river was Class B and the saltwater portion Class SB until April, 1992, and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Aquatic life uses are fully supported near the Back River Reservoir Dam, but may be threatened by significantly decreasing trends in dissolved oxygen and pH, and a significantly increasing trend in turbidity. Although dissolved oxygen and pH excursions occurred, they were

typical of values seen in transitional areas between fresh and salt waters and were considered natural, not standards violations. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. A high concentration of zinc was measured in water in 1993. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration.

Aquatic life uses are fully supported at channel marker 72, but may be threatened by significantly decreasing trends in dissolved oxygen and pH, and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. A high concentration of chromium was measured in the 1993 sediment sample. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration.

Aquatic life uses are also fully supported below the mouth of Goose Creek, but may be threatened by significantly decreasing trends in dissolved oxygen and pH. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration.

At the Mark Clark Expressway bridge, aquatic life uses are fully supported, but may be threatened by sediment contamination. In the 1993 sediment sample, very high concentrations of chromium, copper, mercury, nickel, and zinc were measured. In the same sample, the PAHs acenaphthene, fluoranthene, and pyrene, and PCB-1016 and PCB-1262 were all detected at concentrations well above detection limits. Recreational uses are not supported due to fecal coliform bacteria excursions under new Class SB standards.

At channel marker 49, upstream of Shipyard Creek, aquatic life uses are fully supported, but may be threatened by significantly decreasing trends in dissolved oxygen and pH. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. In the 1991 sediment sample, high concentrations of chromium and zinc were measured. Recreational uses are only partially supported due to fecal coliform bacteria excursions under new Class SB standards.

Aquatic life uses are fully supported under the Grace Memorial Bridge, but may be threatened by a significantly decreasing trend in dissolved oxygen and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported.

On the Town Creek side of Drum Island under the Grace Memorial Bridge aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are only partially supported due to fecal coliform bacteria excursions under new Class SB standards.

Shipyard Creek - Aquatic life uses may not be supported due to sediment contamination. In the 1990 sediment sample, the concentration of chromium was high and PCB-1254 was detected well

above the detection limit. In an early 1991 sediment sample, high concentrations of chromium and zinc were measured. In the same sample the PAHs anthracene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene, benzo(a)anthracene, and 2-methylnaphthalene, and the insecticide dibenzofuran, were all detected at concentrations well above detection limits. In late 1991, the sediment concentration of chromium was very high and zinc concentration was high. In the 1993 sediment sample, very high concentrations of chromium, mercury, and zinc were measured, along with high concentrations of copper and nickel. The PAHs benzo(a)pyrene, fluoranthene and pyrene, and the pesticide guthion, and P,P'DDD and P,P'DDE, metabolites of DDT, were also detected in the 1993 sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. A significantly increasing trend in dissolved oxygen concentration suggests improving conditions. Recreational uses are fully supported. This creek was Class SB until April, 1992.

Filbin Creek - Aquatic life uses are only partially supported due to dissolved oxygen excursions. Recreational uses are not supported due to fecal coliform bacteria excursions. This creek was Class SB until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
COOPER RIVER WESTVACO CORP/CHAS PIPE #: 001 FLOW: 22.9 PIPE #: 002 FLOW: 6.4	SC0001759 MAJOR INDUSTRIAL EFFLUENT EFFLUENT
COOPER RIVER AMERADA HESS/VIRGINIA PIPE #: 001 FLOW: 0.053 PIPE #: 002 FLOW: M/R WQL FOR TOXICS	SC0002852 MINOR INDUSTRIAL WATER QUALITY
COOPER RIVER AMERADA HESS/VIRGINIA PIPE #: 001,002 FLOW: M/R WQL FOR TOXICS	SC0002861 MINOR INDUSTRIAL WATER QUALITY
COOPER RIVER ALLIED TERMINALS/CHAS PIPE #: 001 FLOW: M/R	SC0001350 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER TEXACO LUBRICANTS PIPE #: 001 FLOW: 0.055 WQL FOR TOXICS	SC0003026 MINOR INDUSTRIAL WATER QUALITY

COOPER RIVER BAYER CORP./BUSHY PARK PIPE #: 001 FLOW: 4.889 PIPE #: 001A,002 FLOW: M/R WQL FOR NH3-N, BOD5	SC0003441 MAJOR INDUSTRIAL WATER QUALITY
COOPER RIVER KOCH REFINING CO. PIPE #: 001 FLOW: 0.0812 PIPE #: 002 FLOW: M/R	SC0003794 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER US NAVY/CHARLESTON SHIPYARD PIPE #: 002,004,009,010,011 FLOW: M/R	SC0003816 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER US NAVY/WEAPONS STATION PIPE #: 001 FLOW: 0.056	SC0021385 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER US NAVY/WEAPONS STATION PIPE #: 001,002,003 FLOW: M/R	SC0043206 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER RM ENGINEERED PRODUCTS PIPE #: 001 FLOW: 0.223	SC0003875 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER N.CHAS.SWR.DIST./FELIX DAVIS WWTP PIPE #: 001 FLOW: 27.0 WQL FOR BOD5, DO	SC0024783 MAJOR MUNICIPAL WATER QUALITY
COOPER RIVER E.I. DUPONT PIPE #: 001 FLOW: 1.322 WQL FOR UOD	SC0026506 MINOR INDUSTRIAL WATER QUALITY
COOPER RIVER MARINE ENERGY SYSTEMS CORP. PIPE #: 001 FLOW: 0.015	SC0027502 MINOR INDUSTRIAL EFFLUENT
COOPER RIVER AMOCO CHEMICAL CO. PIPE #: 001 FLOW: 2.33	SC0028584 MAJOR INDUSTRIAL EFFLUENT
COOPER RIVER BCW&SA/LOWER BERKELEY PLT PIPE #: 001 FLOW: 15.0 WQL FOR DO	SC0046060 MAJOR MUNICIPAL WATER QUALITY
COOPER RIVER - DITCH MARATHON OIL CO./N. CHAS PIPE #: 001 FLOW: M/R WQL FOR TOXICS	SC0034134 MINOR INDUSTRIAL WATER QUALITY

COOPER RIVER NUCOR STEEL/BERKELEY PLT PIPE #: 001 FLOW: 1.70 PIPE #: 002,003 FLOW: M/R UNCONSTRUCTED	SC0047392 MAJOR INDUSTRIAL
TIDAL CREEK TO COOPER RIVER CHARLESTON CPW/DANIELS ISLAND PIPE #: 001 FLOW: 0.5 WQL FOR TRC,DO,NH_3-N,BOD_5 UNCONSTRUCTED	SC0047074 MINOR MUNICIPAL WATER QUALITY
TIDAL CREEK TO COOPER RIVER SCE&G/WILLIAMS STA. PIPE #: 001,002,003,004,005 FLOW: M/R	SC0003883 MINOR INDUSTRIAL EFFLUENT
FILBIN CREEK DEFENSE FUEL SUPPORT PIPE #: 001,002 FLOW: M/R	SC0021997 MINOR INDUSTRIAL EFFLUENT
FILBIN CREEK WESTVACO CORP/CHAS PIPE #: 004,005 FLOW: M/R	SC0001759 MAJOR INDUSTRIAL EFFLUENT
SHIPYARD CREEK CHEVRON USA PROD/CHAS. PIPE #: 001,001A FLOW: M/R	SC0001023 MINOR INDUSTRIAL EFFLUENT
SHIPYARD CREEK MACALLOY CORPORATION PIPE #: 001,002,004 FLOW: M/R	SC0004014 MINOR INDUSTRIAL EFFLUENT
SHIPYARD CREEK MACALLOY CORPORATION PIPE #: 003 FLOW: 0.013 WQL FOR TOXICS	SC0004014 MINOR INDUSTRIAL WATER QUALITY
SHIPYARD CREEK SHIPYARD RIVER COAL TERMINAL PIPE #: 001,002 FLOW: M/R	SC0027201 MINOR INDUSTRIAL EFFLUENT
SHIPYARD CREEK FOSTER WHEELER CHAS. PIPE #: 001,002,003,004 FLOW: M/R	SC0041173 MINOR INDUSTRIAL EFFLUENT

The Charleston Harbor Project

One facet of the Charleston Harbor Project (CHP) is its modeling effort in the Cooper River Basin. Working in conjunction with the Department, the University of South Carolina, Clemson University, and the United States Geological Survey (USGS), the projects goal is to develop a tool for the Department's use in point source wasteload allocation and Total Maximum Daily Load (TMDL) determination.

The modeled domain encompasses the Cooper River and its major tributaries from Pinopolis Dam to its confluence with the Wando River, the Wando River from its headwaters to the confluence with the Cooper River, and the Ashley River from Bacon Bridge downstream to the Highway 17 Bridge. Hydrodynamics are modeled using the one-dimensional BRANCH model (Schaffranek et al. 1981) while water quality is modeled using the one-dimensional Branched Lagrangian Transport Model (Jobson and Schoelhammer 1987). The model is calibrated and verified to salinity, dissolved oxygen, carbonaceous biochemical oxygen demand (CBOD), ammonia, organic nitrogen, nitrate, and algae as chlorophyll-a. Calibration and verification data were collected in May and August of 1993 by the Department and the USGS.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
VIRGINIA AVE. (WESTVACO) INDUSTRIAL	—— CLOSED
VIRGINIA AVE. INDUSTRIAL	—— CLOSED
WESTVACO INDUSTRIAL	IWP-201 ACTIVE
VIRGINIA AVE. INDUSTRIAL	—— CLOSED
CITY OF N. CHARLESTON MUNICIPAL	DWP-005 CLOSED
HOLSTON MUNICIPAL	DWP-003 CLOSED
CHARLESTON SHREDDER MUNICIPAL	DWP-079 INACTIVE
CITY OF CHARLESTON MUNICIPAL	DWP-004 CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
OL THOMPSON CONSTR. CO., INC. PRIMUS TRACT	0962-08 SAND/CLAY

Ground Water Concerns

The ground water in the vicinity of the surface dust impoundment owned by MacAlloy Corporation is contaminated with chromium and a ground water corrective action system is being constructed. The facility is currently in the assessment phase. The surface water affected by the ground water contamination is the Cooper River. Also affecting the Cooper River are nitrates as a result of ground water contamination in the vicinity of the Shipyard River Coal Terminal. The facility is in the assessment and monitoring phase due to spill/leaks. Another source of contamination to the Cooper River is the ground water contaminated with metals and organic compounds as a result of unpermitted disposal by the previous owners (SCE&G, City of Charleston, and City of Charleston Housing Authority) of the land now owned by the National Park Service. The ground water in the vicinity of the property owned by Charleston Resource Recovery is contaminated with volatile organics from an unknown source. The facility is currently in the assessment phase, and the surface water affected by the ground water contamination is Shipyard Creek.

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
WR GRACE & CO. (I)	COOPER RIVER	0.432

Growth Potential

The Union Terminal (Sea Port Facility) within the City of Charleston is projected to be an area of population growth. The population in the urban areas west of the Cooper River have declined in the last decade and are not expected to grow in the near future. The U.S. Navy Base/Shipyard is scheduled to be closed by the Navy in 1996. Office/Manufacturing/Industrial reuses of this property will occur well into the future, but residential uses are not significant components of the Base Reuse Plan. The Bushy Industrial Park, which includes several very large industries, is also located in this watershed, and should continue to encourage industrial growth.

Implementation Strategy

Recreational uses for the Cooper River are impaired by elevated fecal coliform bacteria concentrations from point and nonpoint sources. Additional data will be gathered by the point sources and the Department's Watershed Implementation Staff will determine, where possible, the nonpoint source water quality impairments and recommend solutions to correct the problem. Ground water contaminated with metals, nitrates, and organics from three facilities is also impairing the Cooper River. The three sites are in various phases of assessment and monitoring.

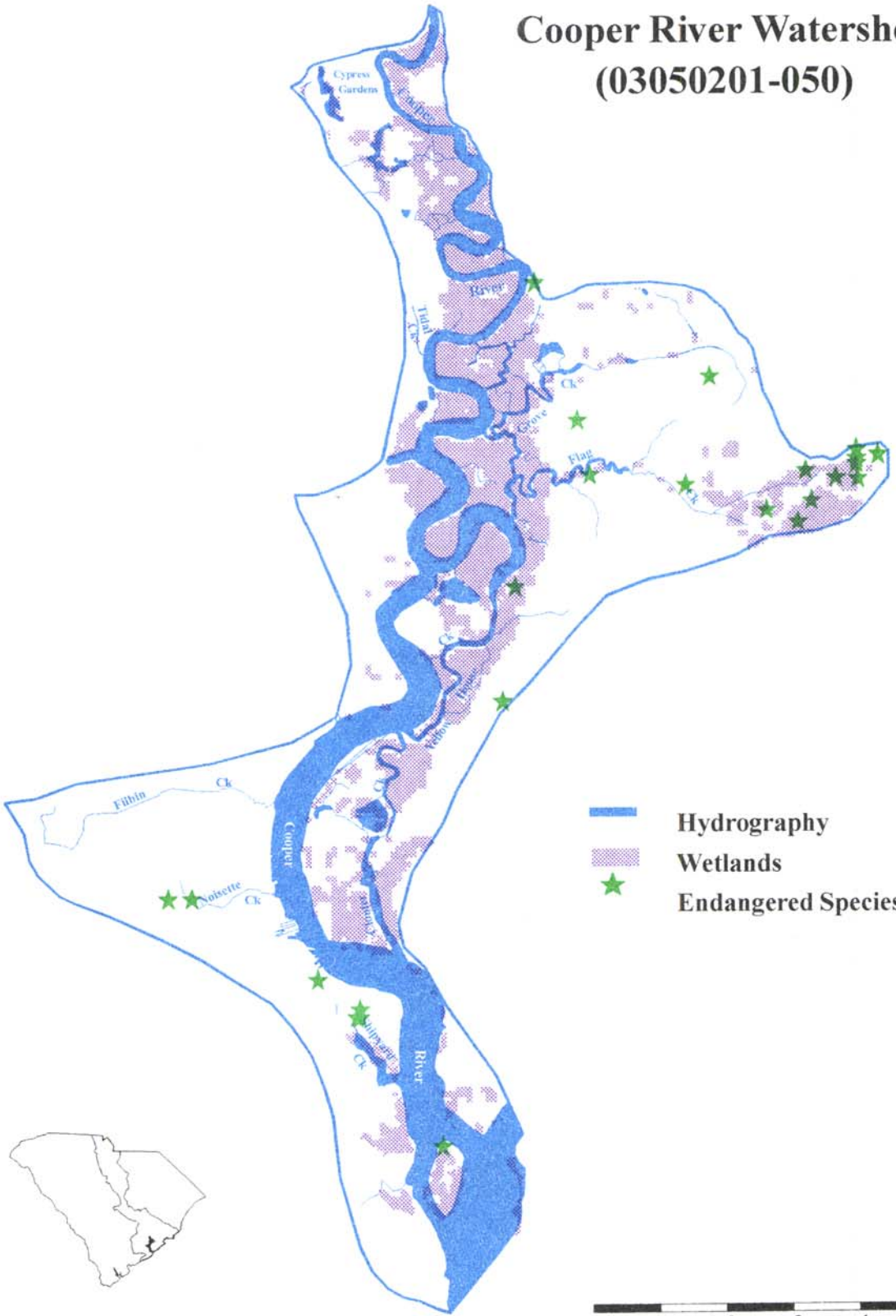
Aquatic life and recreational uses for Filbin Creek are impaired by low dissolved oxygen and elevated fecal coliform bacteria concentrations from point and nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

The aquatic life use is impaired for Shipyard Creek in the form of sediment contaminated with metals and organics due to point and nonpoint sources and poor flushing. An enforcement action to

address this problem is ongoing. An additional impairment to Shipyard Creek is the ground water contaminated with organics entering the system. The facility involved is currently in the assessment phase. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Cooper River Watershed (03050201-050)

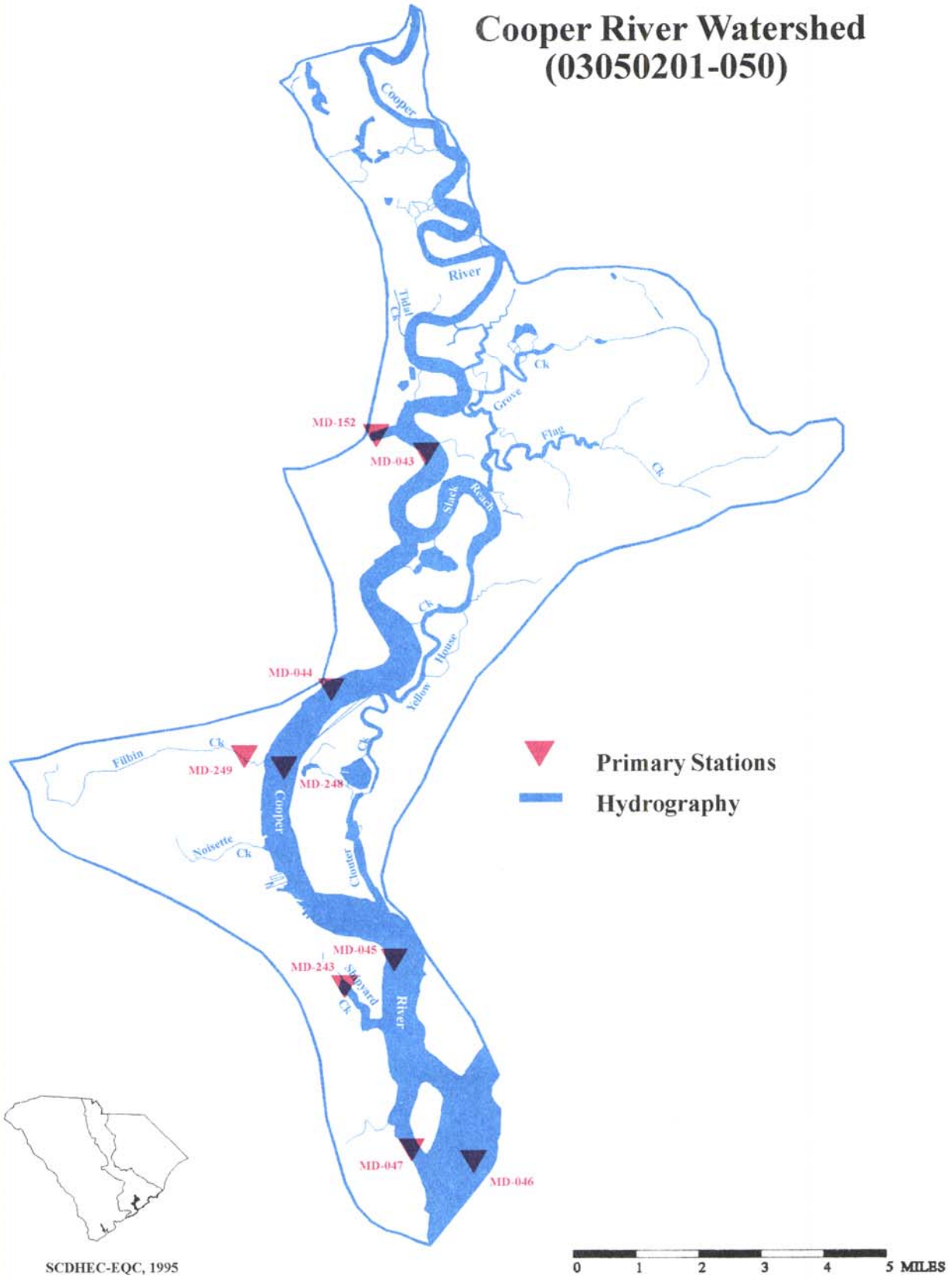


Hydrography
Wetlands
Endangered Species

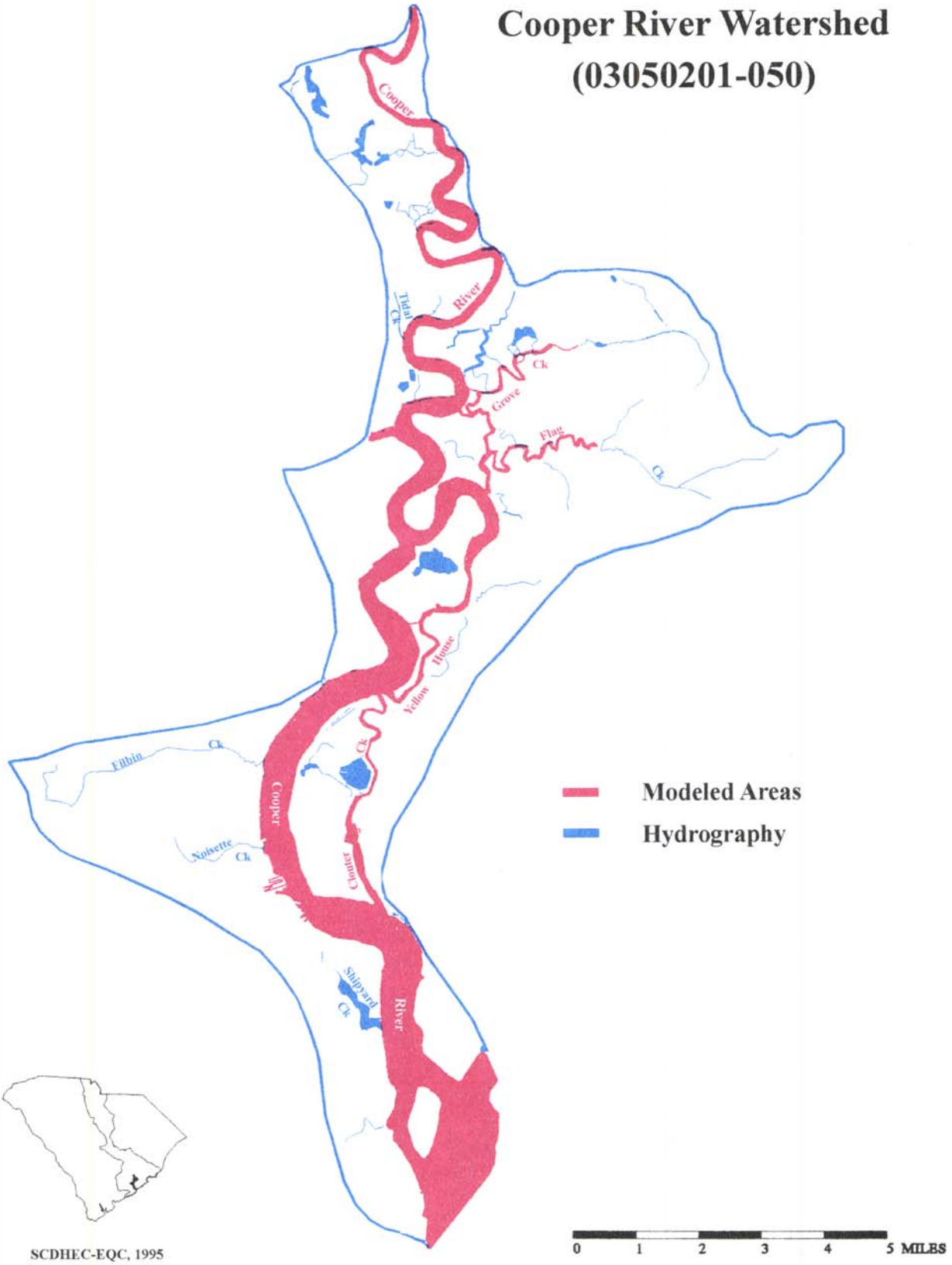
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

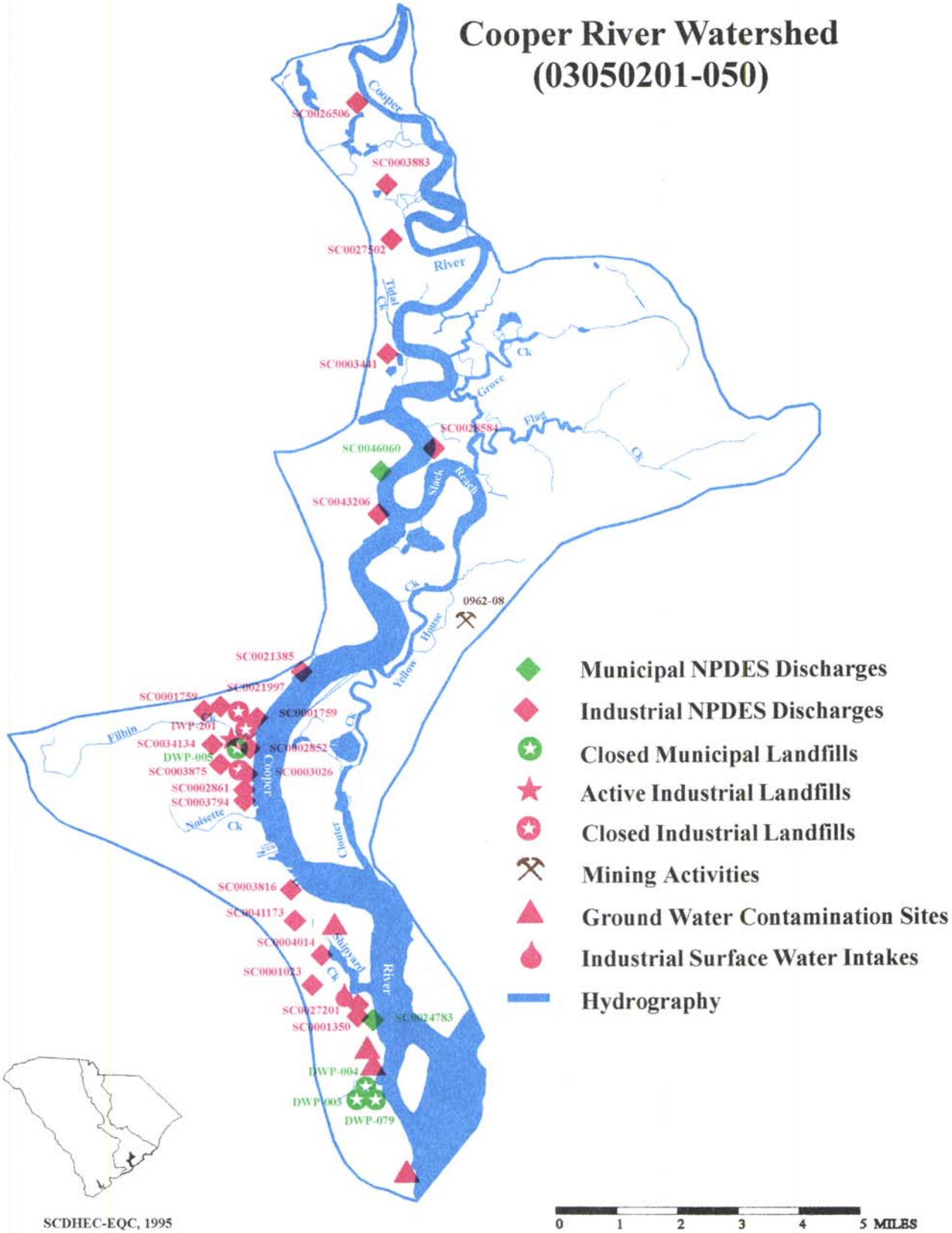


Streams Modeled for Wasteload Allocation



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality



SCDHEC-EQC, 1995

03050201-060

(Back River)

General Description

Watershed 03050201-060 is located in Berkeley County and consists primarily of the ***Back River*** and its tributaries. The watershed occupies 51,563 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Bladen-Wahee-Bohicket-Hobcaw series. The erodibility of the soil (K) averages 0.17; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 10.10% urban land, 5.36% agricultural land, 4.02% scrub/shrub land, 0.86% barren land, 63.97% forested land, 7.91% forested wetland, 5.73% nonforested wetland, and 2.05% water.

The Back River forms from swamp drainage and flows into the Cooper River. Laurel Swamp (Gants Mill Branch, Tillmans Branch, Poplar Branch, Daisy Swamp, King Branch, Huckhole Swamp), Sophia Swamp (Lindsey Branch, Brick Bound Swamp), and Canterhill Swamp flow into the Back River, which is joined downstream by Chicken Creek (Durham Creek). The Back River is dammed further downstream to create the Back River Reservoir and insure freshwater storage for industrial purposes. Water is not released from the dam but is pumped into the Cooper River near Bushy Industrial Park. Prioleau Creek (Long Field Pond, Crane Pond) enters Back River Reservoir in the upper lake region and Foster Creek enters the reservoir near the dam. There are numerous recreational ponds (15-50 acres) in the watershed and a total of 179.1 stream miles, all classified FW.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of this watershed (see Description of Watersheds Within WMU-0303).

Back River Reservoir - The reservoir (850 acres) has been treated annually during the past six years with aquatic herbicides in an attempt to control the growth of aquatic macrophytes in areas of public access and at water intakes.

Foster Creek - Aquatic life uses are not supported due to dissolved oxygen excursions, compounded by a significantly increasing trend in pH. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Durham Creek - Although this site is located in 03050201-030, it represents a significant portion of the waters in this watershed unit. Aquatic life and recreational uses are fully supported. Although dissolved oxygen excursions occurred, they were typical of values seen in blackwater systems and were considered natural, not standards violations. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions.

Activities Potentially Affecting Water Quality

Point Source Contributions

Fosters Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen and fecal coliform concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
BACK RIVER BAYER CORP. PIPE #:003 FLOW:M/R	SC0003441 MAJOR INDUSTRIAL EFFLUENT
BACK RIVER TRIB OAKLEY VOCATIONAL CTR PIPE #: 001 FLOW: 0.0075 WQL FOR BOD_5, NH3-N, TRC, DO	SC0026867 MINOR COMMUNITY WATER QUALITY
BACK RIVER TRIB ALUMAX OF SC/MT HOLLY PIPE #: 001 FLOW: 0.021 PIPE #: 002 FLOW: M/R WQL FOR BOD_5, NH3-N, TRC, DO	SC0036153 MINOR INDUSTRIAL WATER QUALITY
LAUREL SWAMP SEVEN PALMS MHP PIPE #: 001 FLOW: 0.015 WQL FOR BOD_5, NH3-N, TRC, DO	SC0032859 MINOR COMMUNITY WATER QUALITY

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
MILES INC. (I)	BACK RIVER RES.	8.64
EI DUPONT (I)	BACK RIVER RES.	3.24
AMOCO CHEMICAL CO.(I)	BACK RIVER RES.	9.00
CITY OF CHARLESTON (M)	FOSTER CREEK	0.00
FOXBORO GOLF RESORT (I)	BACK RIVER RES.	8.64

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
ACRE MAKER, A PARTNERSHIP 17A MINE PIT	0743-08 SAND/CLAY

Growth Potential

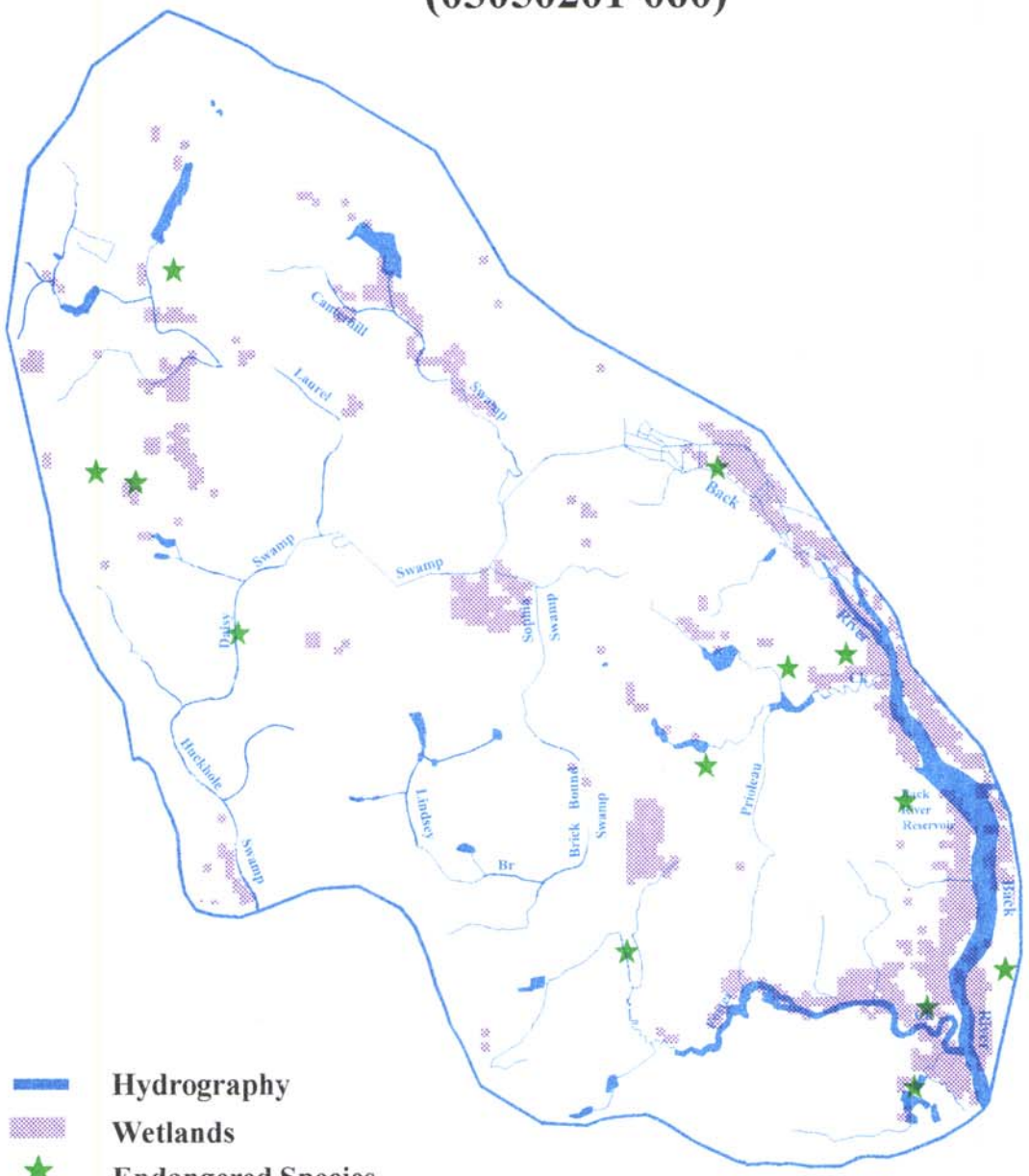
There is a moderate potential for growth in the form of scattered low density development. Water and sewer service is available to most of this watershed. The Back River and its tributaries are the primary source of fresh water for the public water supply and many of the large industries located along the Cooper River. Fresh water is a vital necessity to the area's economy.

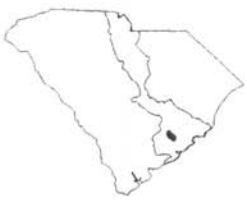
Implementation Strategy

Aquatic life and recreational uses are impaired for Foster Creek due to low dissolved oxygen and elevated fecal coliform bacteria concentrations from overflowing manholes during storm events. The situation is being evaluated for enforcement action. The Department's Watershed Implementation Staff will determine, where possible, any nonpoint source related water quality impairments and recommend solutions to correct the problem. The Department will continue to monitor fish, water, and sediment levels of mercury and will add and/or revise consumption advisories to reflect current conditions. In addition, some monitoring may be conducted to determine the amount of mercury in the atmosphere.

Natural Resources

Back River Watershed
(03050201-060)





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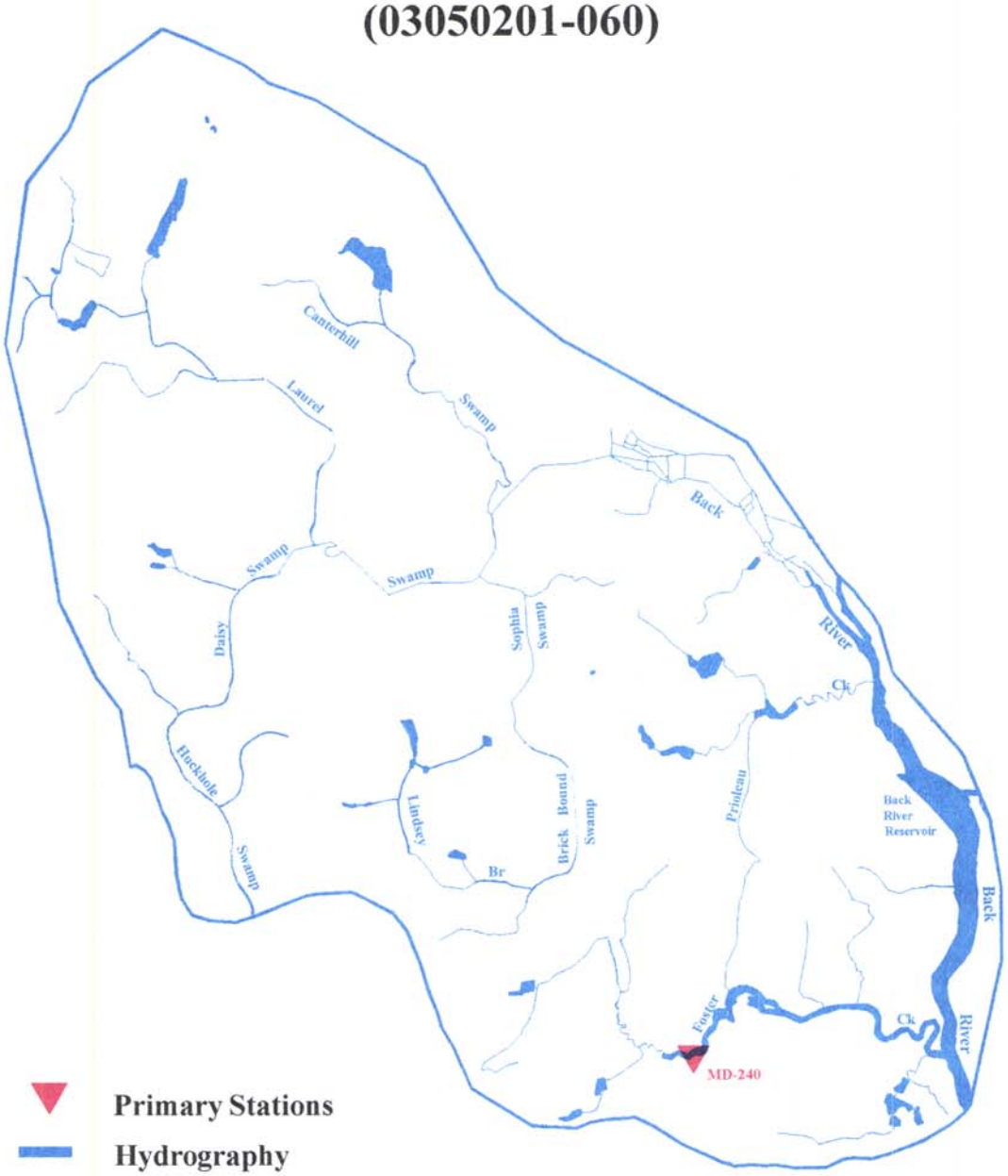
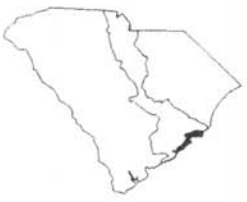
SCDHEC-BQC, 1995

Water Quality Monitoring Stations

Back River Watershed
(03050201-060)





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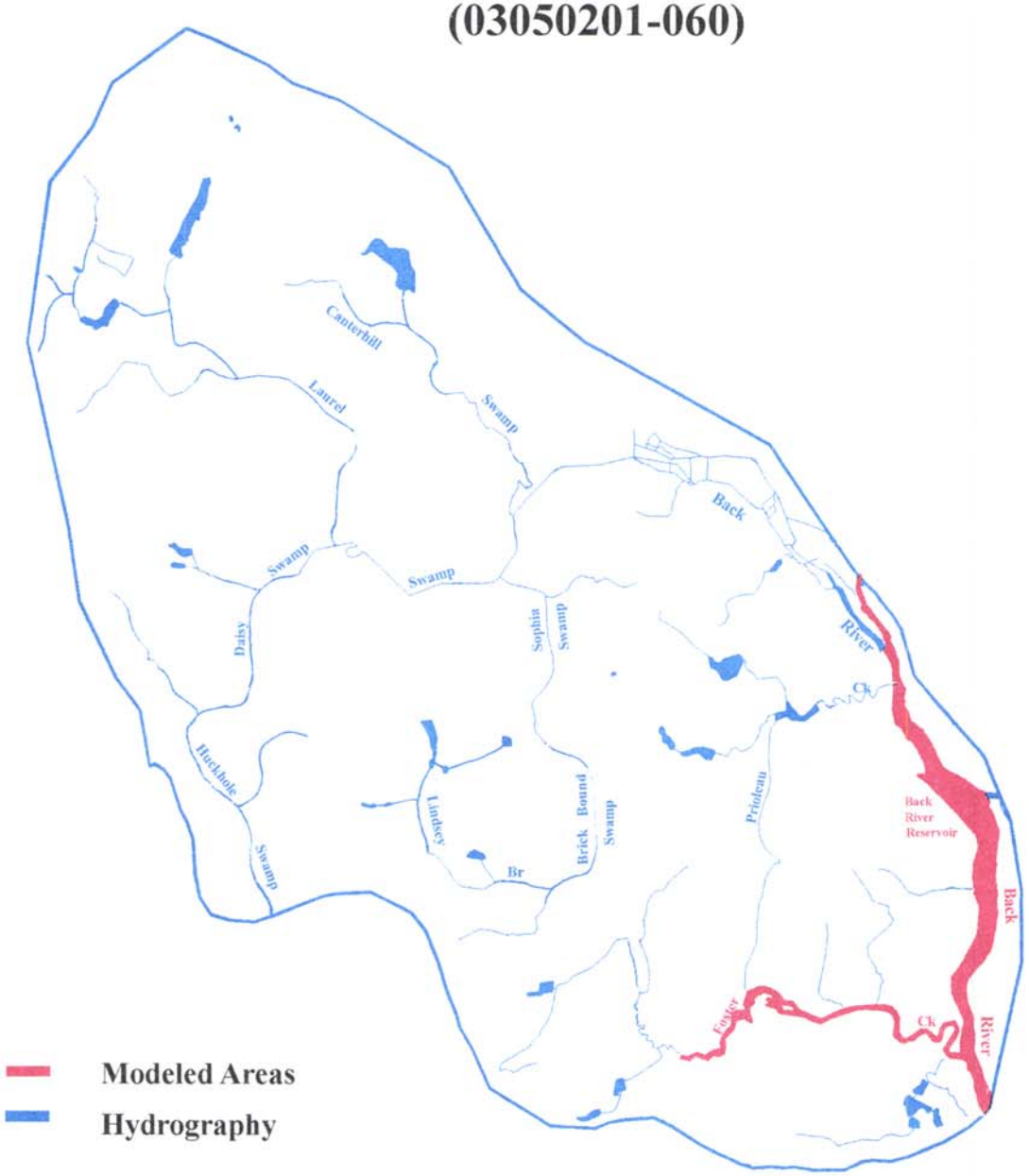
SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Back River Watershed
(03050201-060)



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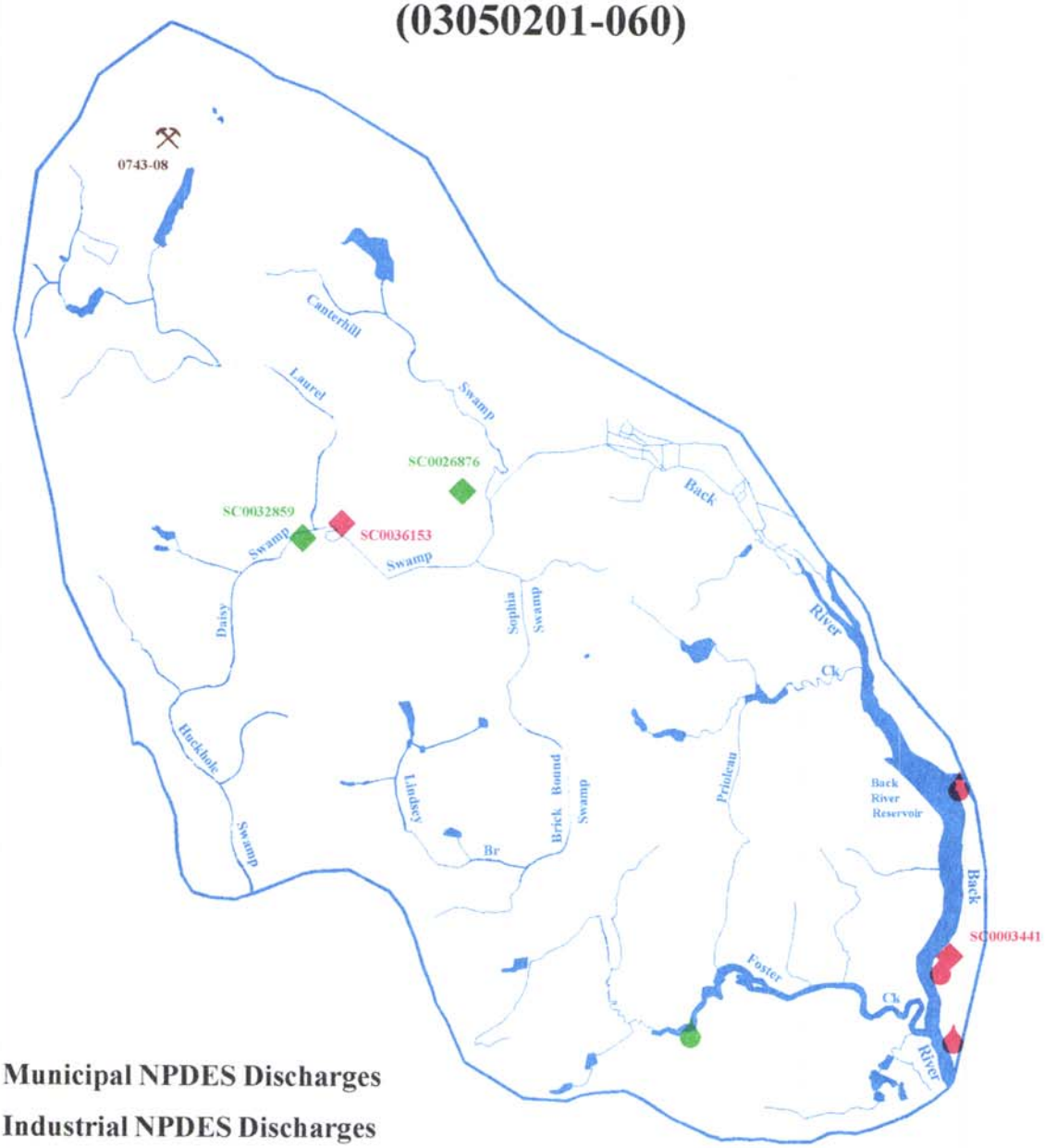
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Back River Watershed
(03050201-060)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Mining Activities
- Municipal Surface Water Intakes
- Industrial Surface Water Intakes
- Hydrography

03050201-070

(Goose Creek)

General Description

Watershed 03050201-070 is located in Berkeley, Charleston and Dorchester Counties and consists primarily of ***Goose Creek*** and its tributaries. The watershed occupies 39,916 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Bohicket-Bladen-Wahee-Yonges series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 44.89% urban land, 2.15% agricultural land, 3.16% scrub/shrub land, 0.09% barren land, 28.40% forested land, 14.21% forested wetland, 4.36% nonforested wetland, and 2.74% water.

Ancrum Swamp and Huckhole Swamp flow into Bluehouse Swamp (Ladson Branch, McChune Branch) to form the headwaters of Goose Creek, which is dammed into Goose Creek Reservoir and used for recreation and water supply. Turkey Creek flows into Goose Creek downstream of the reservoir near the Town of Hanahan. Old Goose Creek drains into Goose Creek as does New Tenant Pond, Brown Pond, and Logan Pond before it flows into the Cooper River. The entire watershed is within the U.S. Naval Reserve. Goose Creek is classified FW from its headwaters through to the Goose Creek Reservoir Dam, and SB downstream from the reservoir. There are a total of 52.7 stream miles in this watershed, and 2.7 square miles of estuarine areas.

Water Quality

Goose Creek - There are two SCDHEC monitoring sites along Goose Creek. The freshwater portion of this creek was Class B and the saltwater portion Class SB until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Upstream of the Goose Creek Reservoir, aquatic life uses are not supported due to dissolved oxygen and pH excursions. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. A high concentration of zinc was measured in water in 1991. An elevated concentration of lead was measured in water in 1992, and an elevated concentration of chromium was measured in water in 1993. Recreational uses are only partially supported due to fecal coliform bacteria excursions under Class FW standards.

Downstream of the reservoir, aquatic life uses may be only partially supported due to a very high concentration of zinc measured in 1992. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. A significantly decreasing trend in pH was also detected. Recreational uses are not supported due to fecal coliform bacteria excursions under new Class SB standards.

Goose Creek Reservoir - Categorized as a minor lake, Goose Creek Reservoir has a watershed covering 15.9 km^2, a surface area of 242.8 hectares, and a maximum and mean depth of 4.3m and 2.4m, respectively. Swimming and boating usages of the lake may be impaired due to abundant

submerged aquatic plants lakewide, and emergent and floating plants near the dam. A single Algal Growth Potential Test, conducted in the summer of 1989, indicated that the limiting nutrients were nitrogen and phosphorus. Eutrophication studies classified Goose Creek Reservoir as Category II for intermediate trophic condition which may be susceptible to further degradation, and protection is recommended. A Phase I Diagnostic/Feasibility Study of Goose Creek Reservoir was conducted to determine the current condition of the lake, and to recommend methods for reducing aquatic plant biomass and improving dissolved oxygen concentrations. It was concluded that the aquatic plants contribute to low dissolved oxygen concentrations by limiting circulation and through decomposition. Recommendations included an integrated aquatic plant management strategy of harvesting, grass carp stocking, and herbicide application, as well as organic sediment removal (SCDHEC 1994f). Goose Creek Reservoir has been treated annually for the past six years by SCDNR with aquatic herbicides in an attempt to control the growth of aquatic macrophytes that have impaired the lake's recreational and water supply uses. Fishing is also impaired due to low dissolved oxygen levels. An autumn sampling revealed DO levels less than 3.0 mg/l in the headwaters of the lake. Grass Carp were introduced into the reservoir in 1991 at a stocking rate of 10 fish/vegetated acre for a total of 4000 fish.

There are three SCDHEC monitoring sites within Goose Creek Reservoir, which was Class B until April, 1992. Recreational uses are fully supported at all three sites. Aquatic life uses are not supported at the furthest uplake site due to dissolved oxygen excursions. Excursions of pH occurred; however, higher levels occur naturally in lakes with significant phytoplankton communities and are considered to be natural, not standards violations. Aquatic life uses are also not supported midlake due to dissolved oxygen excursions, compounded by significantly decreasing trends in dissolved oxygen concentration and pH. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. Near the dam, aquatic life uses are again not supported due to dissolved oxygen excursions. A high concentration of cadmium and a very high concentration of copper were measured at this site in the 1992 sediment sample.

Activities Potentially Affecting Water Quality

Point Source Contributions

Goose Creek is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen, fecal coliform, and toxicity concerns. Goose Creek Reservoir is also included on the §303(d) low priority list for dissolved oxygen concerns.

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
GOOSE CREEK	SC0021041
CITY OF HANAHAN	MAJOR MUNICIPAL
PIPE #: 001 FLOW: 1.25	WATER QUALITY
WQL FOR NH3-N	

GOOSE CREEK CITY OF HANAHAN PIPE #: 001 FLOW: 2.05 PROPOSED; WQL FOR NH3-N,TRC,DO	SC0021041 MAJOR MUNICIPAL WATER QUALITY
GOOSE CREEK CHARLESTON CPW/HANAHAN PIPE #: 001 FLOW: M/R	SC0040266 MINOR INDUSTRIAL EFFLUENT
GOOSE CREEK SPEEDWAY #208/REMOUNT RD. PIPE #: 001 FLOW: 0.0216 WQL FOR TOXICS	SC0042820 MINOR INDUSTRIAL WATER QUALITY
TURKEY CREEK US AIR FORCE/CHAS.BASE PIPE #: 002,005 FLOW: M/R	SC0003921 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Contributions

Goose Creek is included on the §319 list of waters impacted by urban runoff. Water samples collected by the Department indicate elevated nutrient and ammonia levels on numerous occasions, together with numerous dissolved oxygen excursions. The samples also indicate scattered elevated levels of fecal coliform and toxic materials.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
GOOSE CREEK & SCA MUNICIPAL	—— CLOSED
UNNAMED INDUSTRIAL	—— CLOSED
G&S ROOFING PRODUCTS INDUSTRIAL	IWP-046 INACTIVE
CITY OF HANAHAN MUNICIPAL	—— CLOSED
CITY OF CHARLESTON MUNICIPAL	DWP-004 CLOSED
WESTVACO INDUSTRIAL	IWP-177 CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
BANKS CONSTRUCTION COMPANY LAKEVIEW MINE	0488-10 SAND/CLAY

BUTLER WARE TRUCKING, INC. TAYLOR STREET PIT	0773-10 SAND/CLAY
ROBERT O. COLLINS COMPANY, INC. SPRINGROVE MINES	0595-10 SAND/CLAY
LB CARSON GRANT CITY NORTH	0818-10 SAND

Water Supply

WATER USER (TYPE)	*STREAM*	*AMOUNT WITHDRAWN (MGD)*
CITY OF CHARLESTON (M)	GOOSE CREEK RES.	0.00

Growth Potential

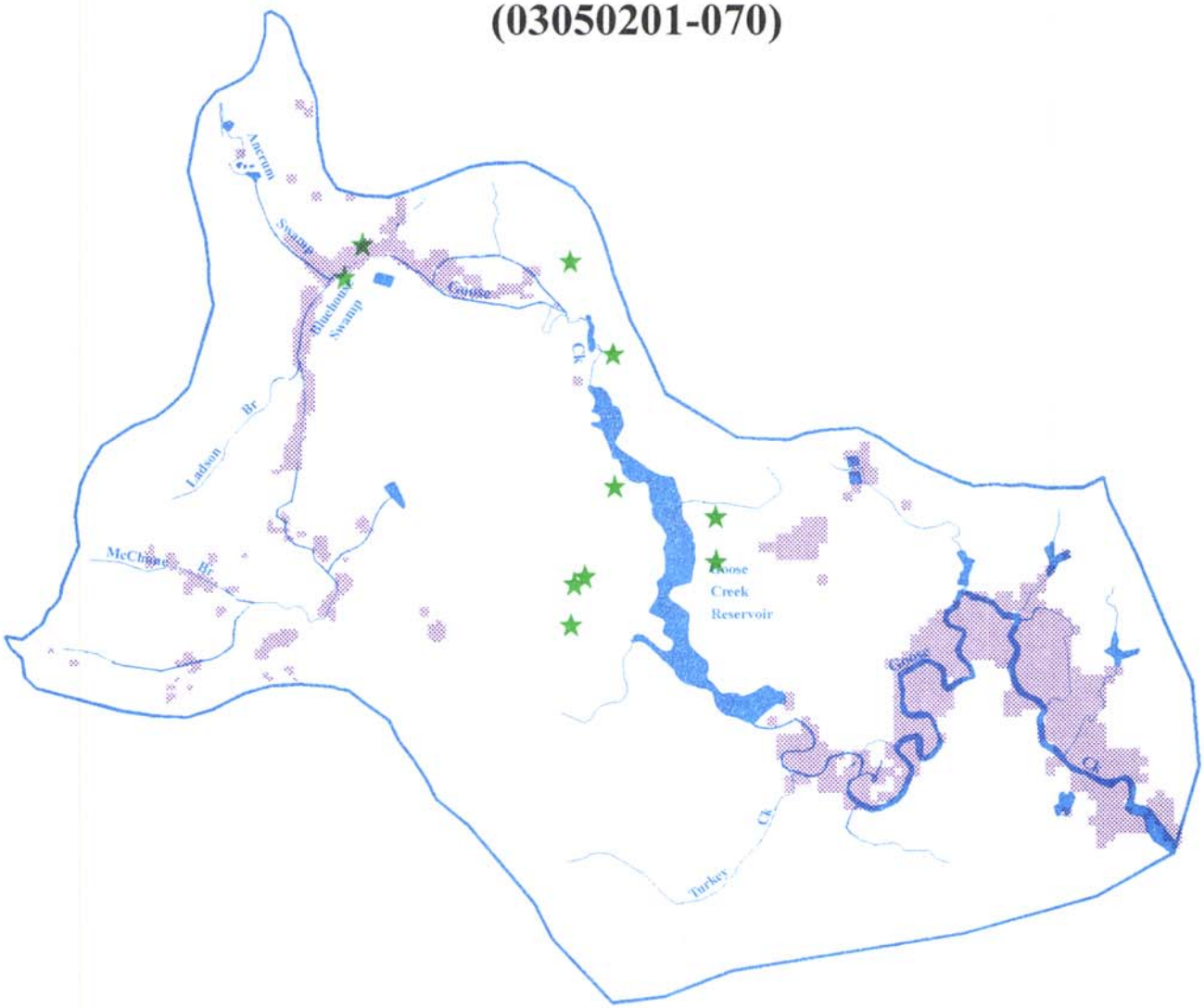
The primary population growth areas in this watershed include the Brown Tract and Eagle Landing in the Town of Hanahan; The Elms, Arbor Lakes, and the Baker Tract in North Charleston; and Ryan Creek, Pembroke, Lakeview Terrace, Stonehurst, Crowfield Plantation, The Hamlets, and The Ashton in Berkeley County. In addition, the Charleston County Parks and Recreation Commission has purchased a large parcel of land above Goose Creek Reservoir for development as a county park.

Implementation Strategy

Aquatic life and recreational uses are impaired for Goose Creek due to low pH and dissolved oxygen, and elevated zinc and fecal coliform bacteria concentrations from overflowing manholes during storm events. The situation is being evaluated for enforcement action. The Department's Watershed Implementation Staff will determine, where possible, any nonpoint source related water quality impairments and recommend solutions to correct the problem. Aquatic life use is impaired for Goose Creek Reservoir due to low dissolved oxygen concentrations resulting from an overabundance of aquatic plants. The dense aquatic vegetation contributes to seasonally low dissolved oxygen concentrations through respiration, inhibition of water movement, atmospheric reaeration, and decomposition. It has been recommended that the Aquatic Plant Management Strategy be integrated with harvesting, grass carp stocking, herbicide application, and sediment removal.

Natural Resources

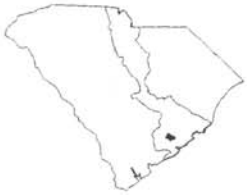
Goose Creek Watershed
(03050201-070)



Hydrography

Wetlands

Endangered Species

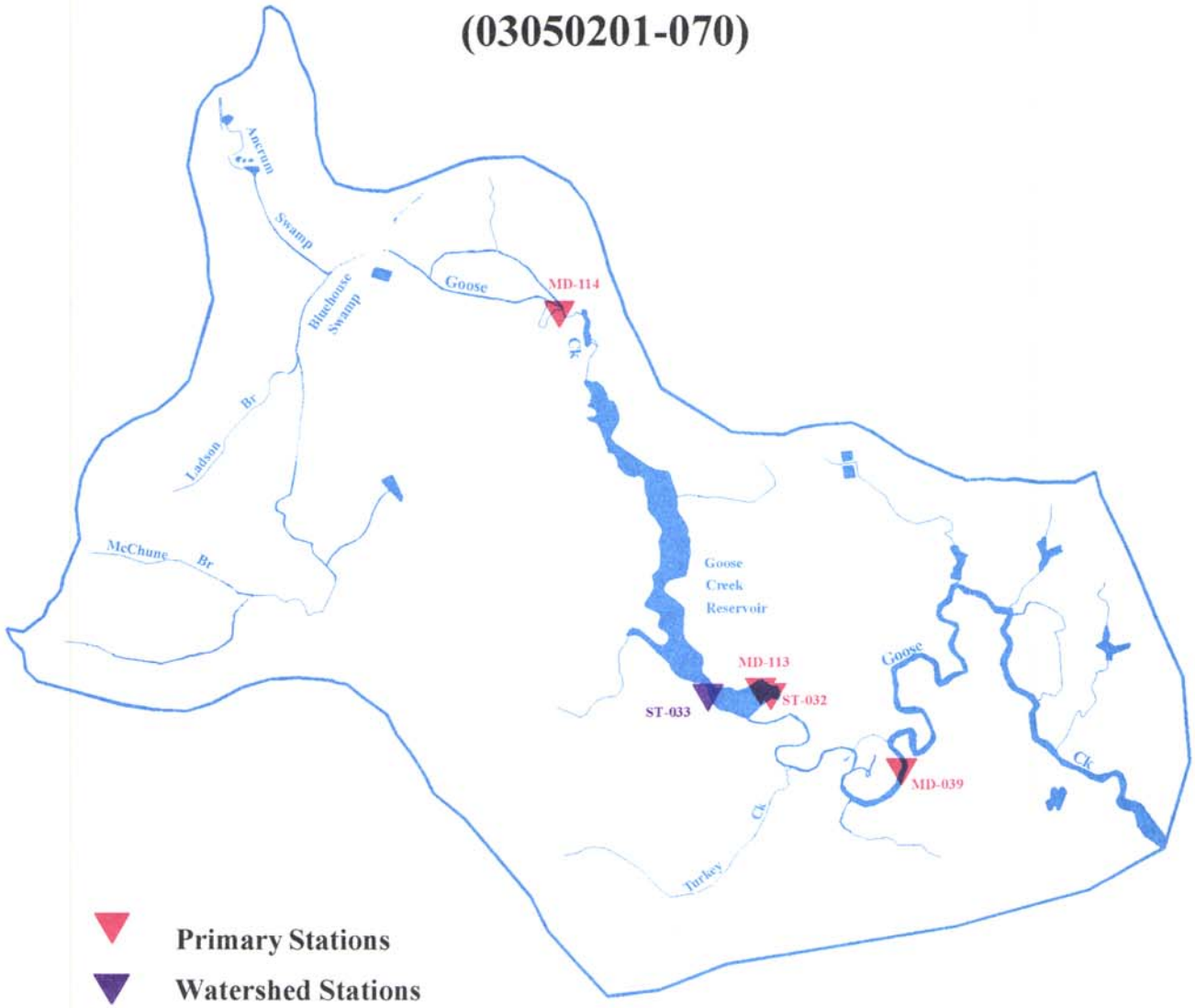


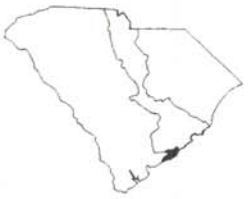
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Goose Creek Watershed
(03050201-070)



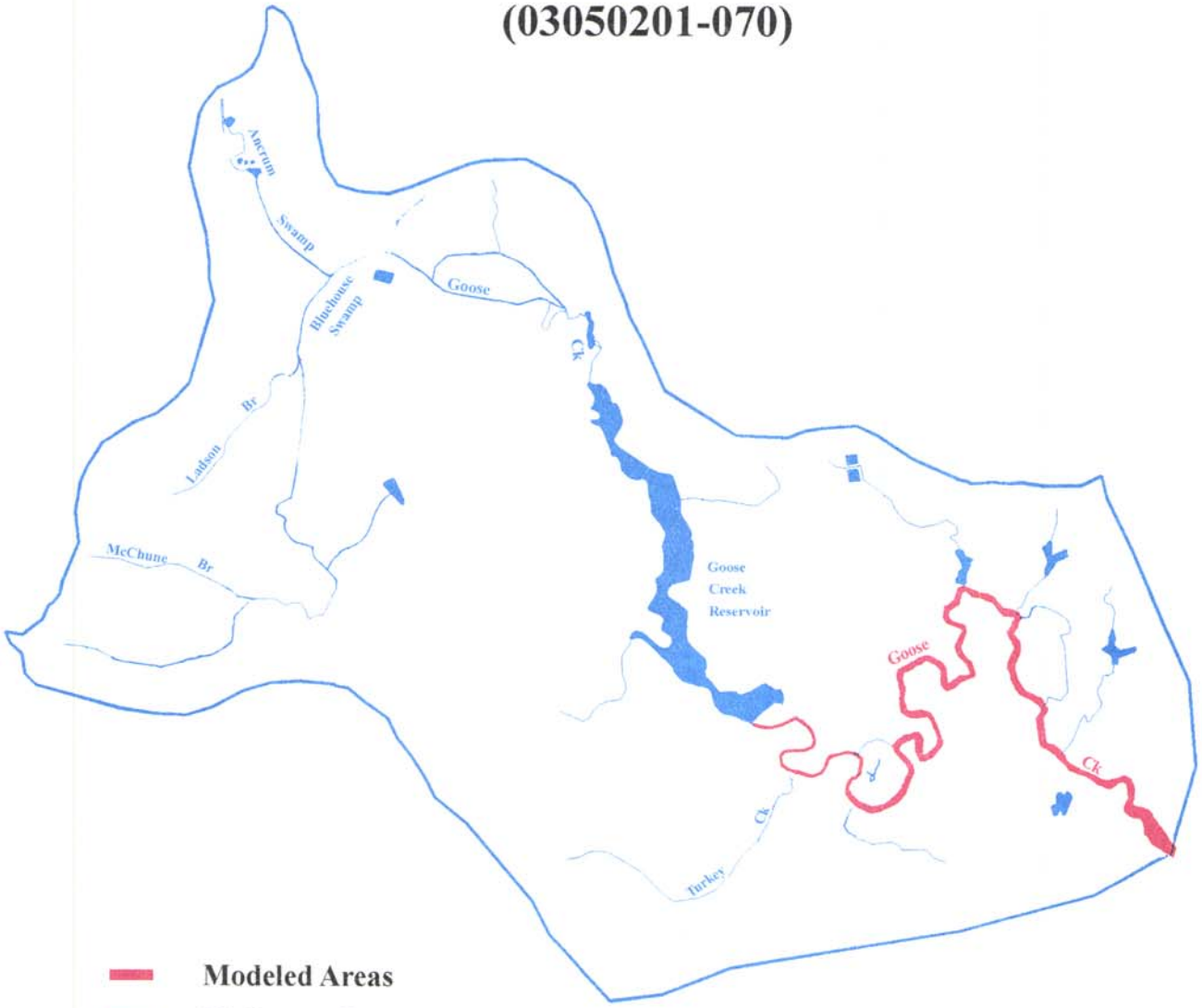


0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Goose Creek Watershed
(03050201-070)



Modeled Areas

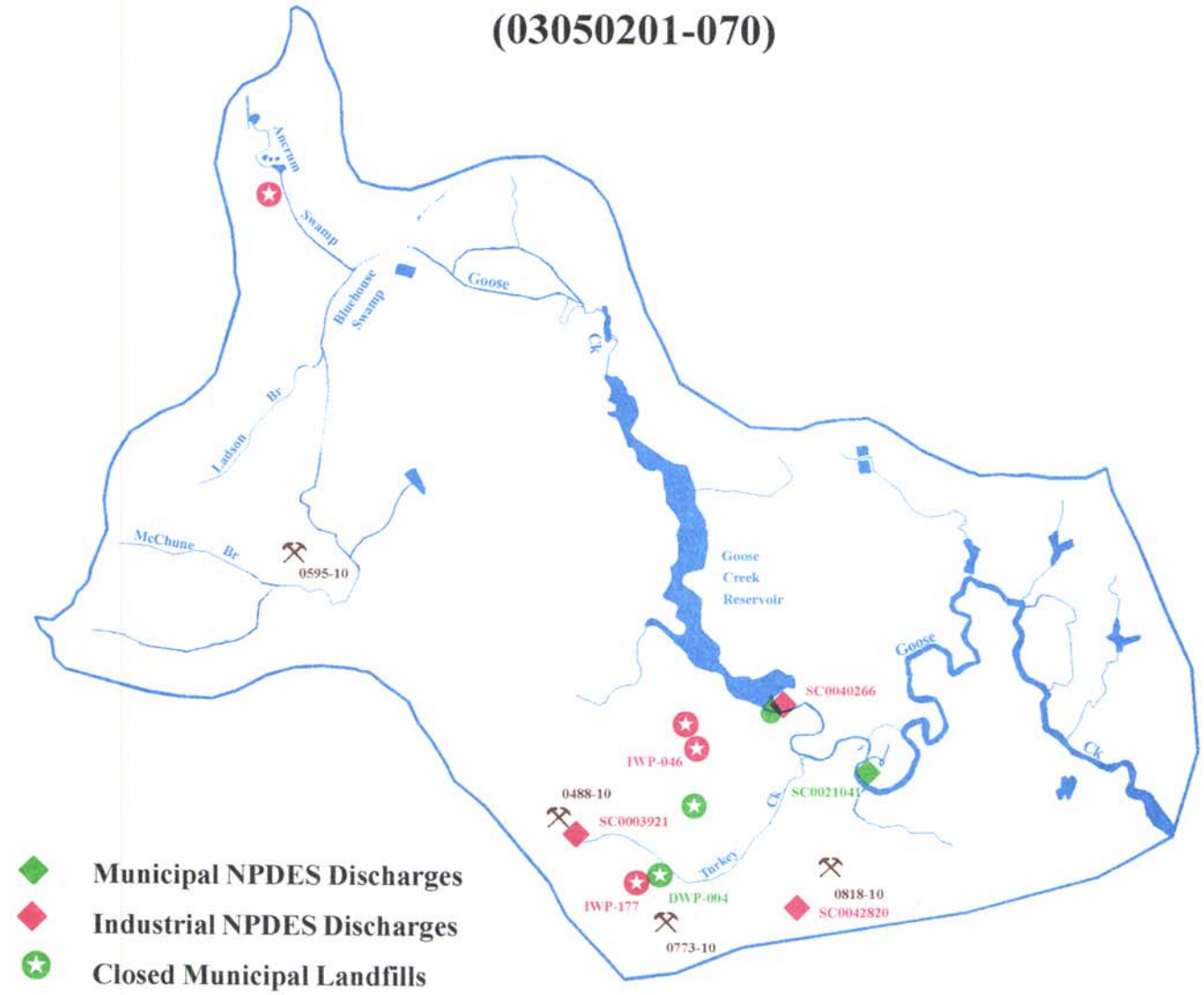
Hydrography

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Goose Creek Watershed
(03050201-070)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Closed Municipal Landfills
- Closed Industrial Landfills
- Mining Activities
- Municipal Surface Water Intakes
- Hydrography

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050201-080

(Wando River)

General Description

Watershed 03050201-080 extends through Berkeley and Charleston Counties and consists primarily of the ***Wando River*** and its tributaries. The watershed occupies 66,213 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Bohicket-Chipley-Yonges-Kiawah-Chisolm series. The erodibility of the soil (K) averages 0.12; the slope of the terrain averages 1%, with a range of 0-6%. Land use/land cover in the watershed includes: 7.86% urban land, 1.49% agricultural land, 2.37% scrub/shrub land, 0.03% barren land, 51.14% forested land, 15.33% forested wetland, 9.17% nonforested wetland, and 12.61% water.

The Wando River accepts drainage from the Iron Swamp (Mayrants Reserve), Alston Creek, Darrell Creek, Deep Creek, Toomer Creek, and Wagner Creek before receiving Guerin Creek drainage (Lachicotte Creek, Old House Creek, Fogarty Creek) near Cat Island. The Guerin Creek drainage flows through the Francis Marion National Forest. Johnfield Creek enters the river downstream followed by Horlbeck Creek (Boone Hall Creek), Fosters Creek, Beresfords Creek (Martin Creek, Sanders Creek, Hopewell Creek), Ralston Creek, Rathall Creek and Bermuda Creek. Beresford Creek is connected to Clouter Creek in watershed 03050201-050. From the headwaters to Ralston Creek, the Wando River is Classified SFH; downstream to its confluence with the Cooper River, the Wando River is classified SA. Hobcaw Creek (Lake Woodlawn) and Molasses Creek enter the Wando River at the base of the watershed (SA) near the Town of Mount Pleasant. The Wando River then drains into the Cooper River which flows into the Charleston Harbor. There are a total of 0.6 stream miles and 26.0 square miles of estuarine area in this watershed. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Iron Swamp including Myrants Reserve and portions of the Wando River.

Water Quality

Wando River - There are two SCDHEC monitoring sites along the Wando River. Dissolved oxygen excursions occurred at both sites; however, they were typical of values seen in tidally influenced systems with significant marsh drainage, and were considered to be natural in origin, not standards violations. Aquatic life may not be supported at the upstream site due to very high concentrations of copper and zinc measured in 1989 and an elevated concentration of cadmium measured in 1989, compounded by significantly declining trends in dissolved oxygen concentration and pH. In the 1991 sediment sample, high concentrations of copper and zinc were measured. In the 1993 sediment sample, chromium and copper were high and the zinc concentration was very high. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported.

At the downstream site, aquatic life uses are fully supported, but may be threatened by a significantly declining trend in dissolved oxygen concentration. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentrations.

Iron Swamp Tributary- Aquatic life and recreational uses are fully supported.

Sanitary Bathing Areas

RECREATIONAL STREAM *BATHING SITE*	*PERMIT #* *STATUS*
WANDO RIVER PALMETTO ISLANDS COUNTY PARK	10-01N ACTIVE

Shellfish Harvesting Status

Waters restricted to shellfish harvesting include the waters of the Wando River and its tributaries (Alston Creek excluded) from its headwaters to the Prohibited area at Detyens Shipyard, Nowell Creek (from its confluence with Beresford Creek to its confluence with Hopewell Creek), Rathall Creek, Ralston Creek, Horlbeck Creek, Guerin Creek, Wagner Creek, Toomer Creek, Deep Creek, and Darrell Creek. Waters prohibited to harvesting include the waters of the Wando River and its tributaries from its confluence with Charleston Harbor northeast to the Mark Clark Expressway bridge, the Wando River within 1000 feet of Detyens Shipyard, and the waters of Alston Creek. Hydrographic characteristics in combination with nonpoint sources have a significant impact on shellfish in this watershed. Fresh water drainage from the Francis Marion National Forest and poor flushing affect the upper reaches of the Wando River, together with nonpoint source runoff from septic tanks, increased housing density and related shoreline activities. The lower reaches of the river are potentially impacted by wastewater treatment facilities, marinas, and dredge disposal sites.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
WANDO RIVER DETYENS SHIPYARDS IN PIPE #: 001 FLOW: 0.025	SC0033022 MINOR INDUSTRIAL EFFLUENT

The Charleston Harbor Project

One facet of the Charleston Harbor Project (CHP) is its modeling effort in the Wando River. Working in conjunction with the Department, the University of South Carolina, Clemson University,

and the United States Geological Survey (USGS), the projects goal is to develop a tool for the Department's use in point source wasteload allocation and Total Maximum Daily Load (TMDL) determination.

The modeled domain encompasses the Cooper River and its major tributaries from Pinopolis Dam to its confluence with the Wando River, the Wando River from its headwaters to the confluence with the Cooper River, and the Ashley River from Bacon Bridge downstream to the Highway 17 Bridge. Hydrodynamics are modeled using the one-dimensional BRANCH model (Schaffranek et al. 1981) while water quality is modeled using the one-dimensional Branched Lagrangian Transport Model (Jobson and Schoelhammer 1987). The model is calibrated and verified to salinity, dissolved oxygen, carbonaceous biochemical oxygen demand (CBOD), ammonia, organic nitrogen, nitrate, and algae as chlorophyll-a. Calibration and verification data were collected in May and August of 1993 by the Department and the USGS.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
SIX MILE ROAD MUNICIPAL	---- CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
ISLAND CONSTRUCTION CO.,INC. R&L PIT	0568-10 SAND/CLAY
C & G INVESTMENTS LUCKER MINE	0735-10 SAND
DOUG HARDMAN, INC. STANCAR MINE	0901-10 SAND/CLAY
SHELLMORE FARMS (LJ INC.) SHELLMORE FARMS MINE	0641-10 SAND/CLAY

Growth Potential

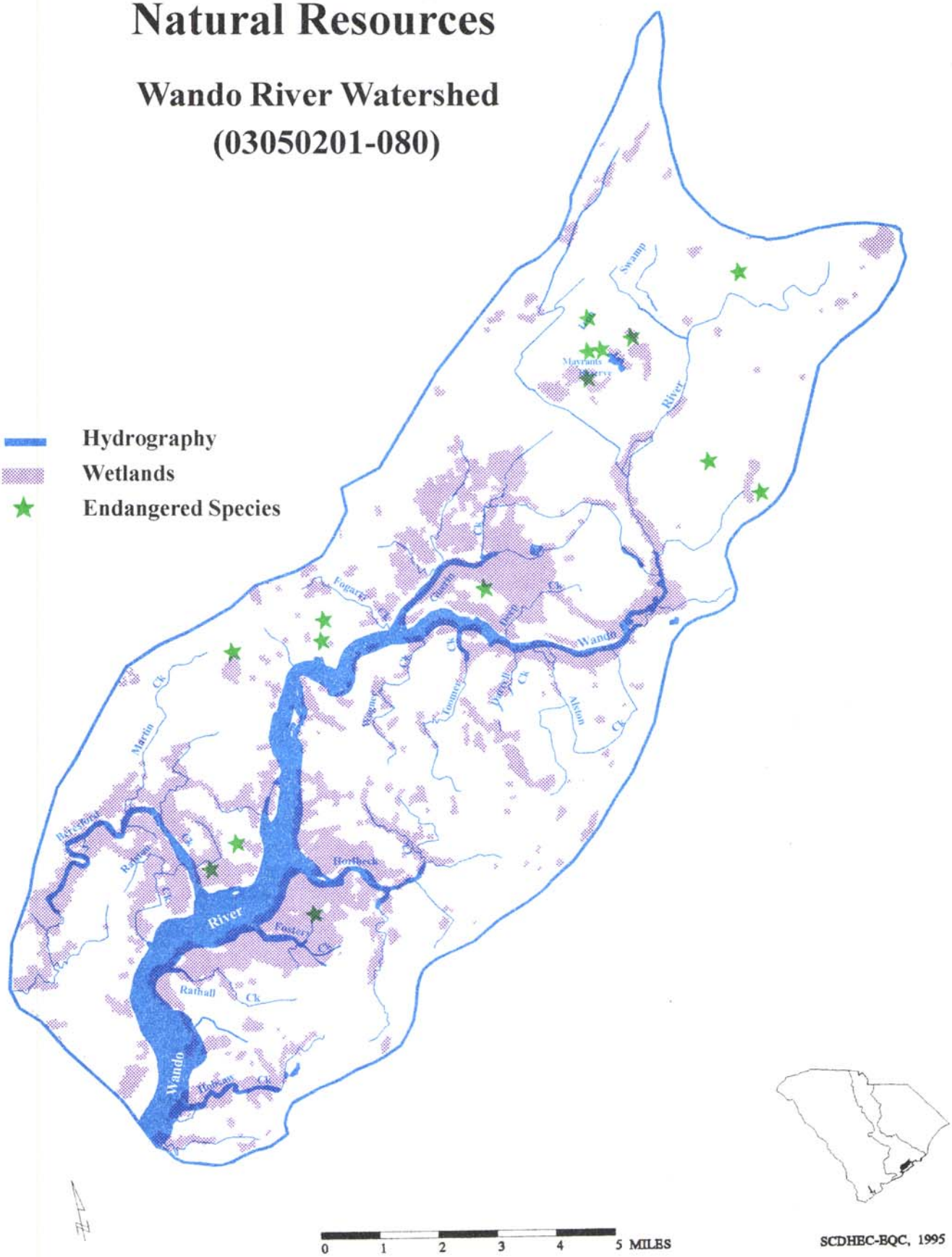
There is a high potential for growth projected for this watershed. Some of the major development areas include: Dunes West, Liberty, Rivertowne, Brickyard, Long Point, Belle Hall, and Daniel Island. Water and sewer services are available in all potential growth areas.

Implementation Strategy

Aquatic life uses are impaired for the Wando River due to elevated levels of cadmium, zinc, and copper from shipyard operations. The NPDES permits are being brought into compliance.

Natural Resources

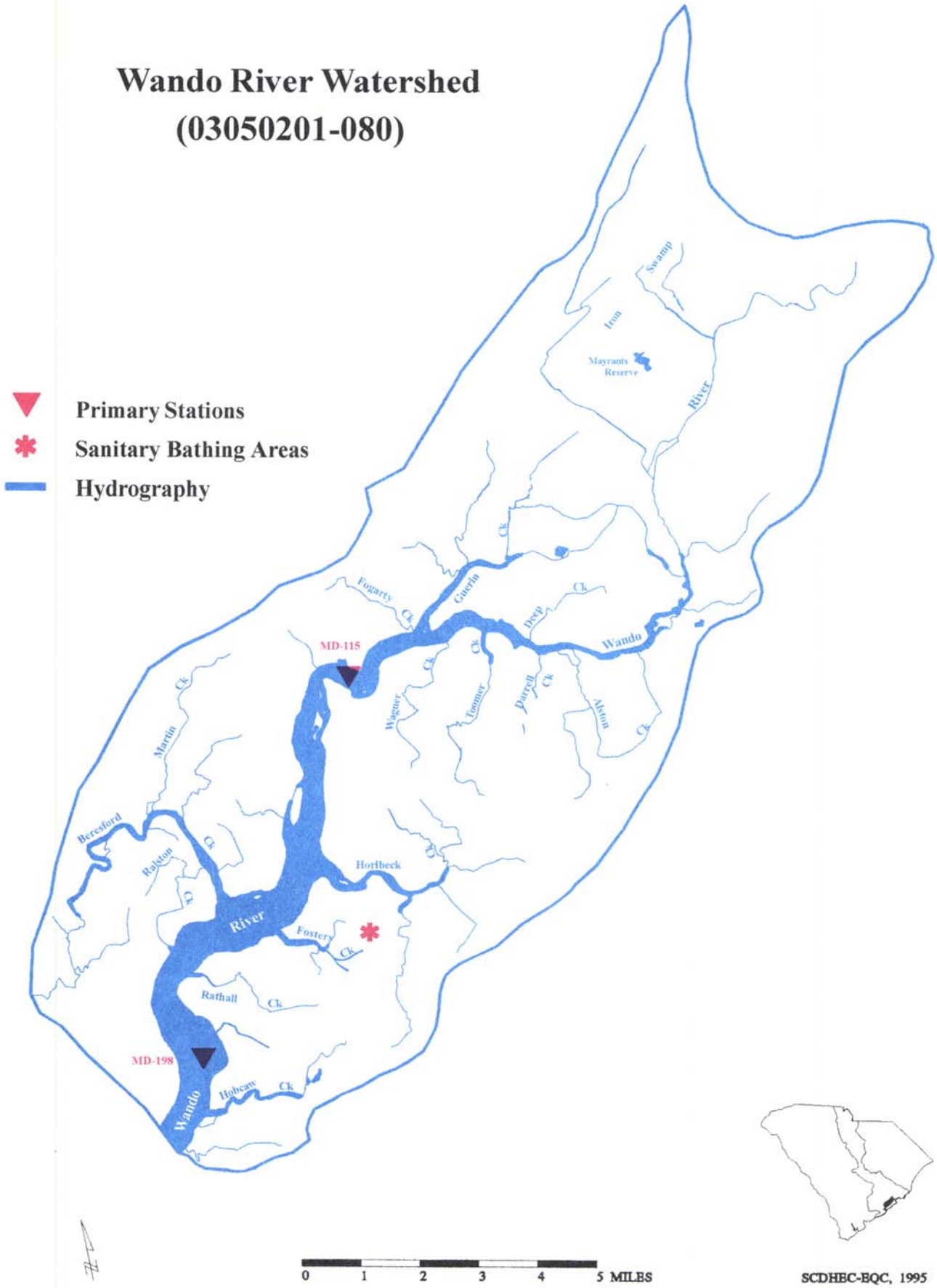
Wando River Watershed
(03050201-080)



SCDHEC-BQC, 1995

Water Quality Monitoring Stations

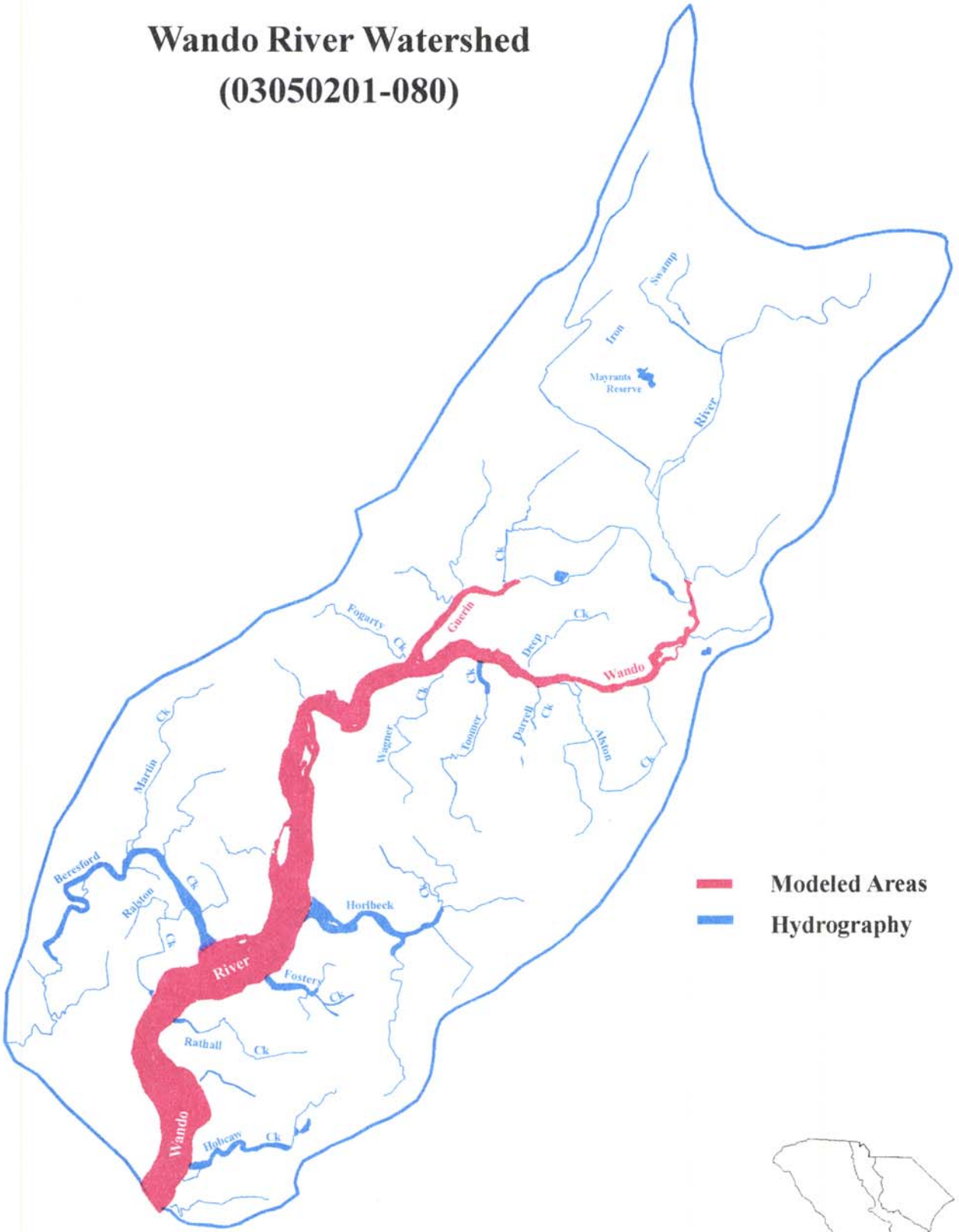
Wando River Watershed
(03050201-080)



SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

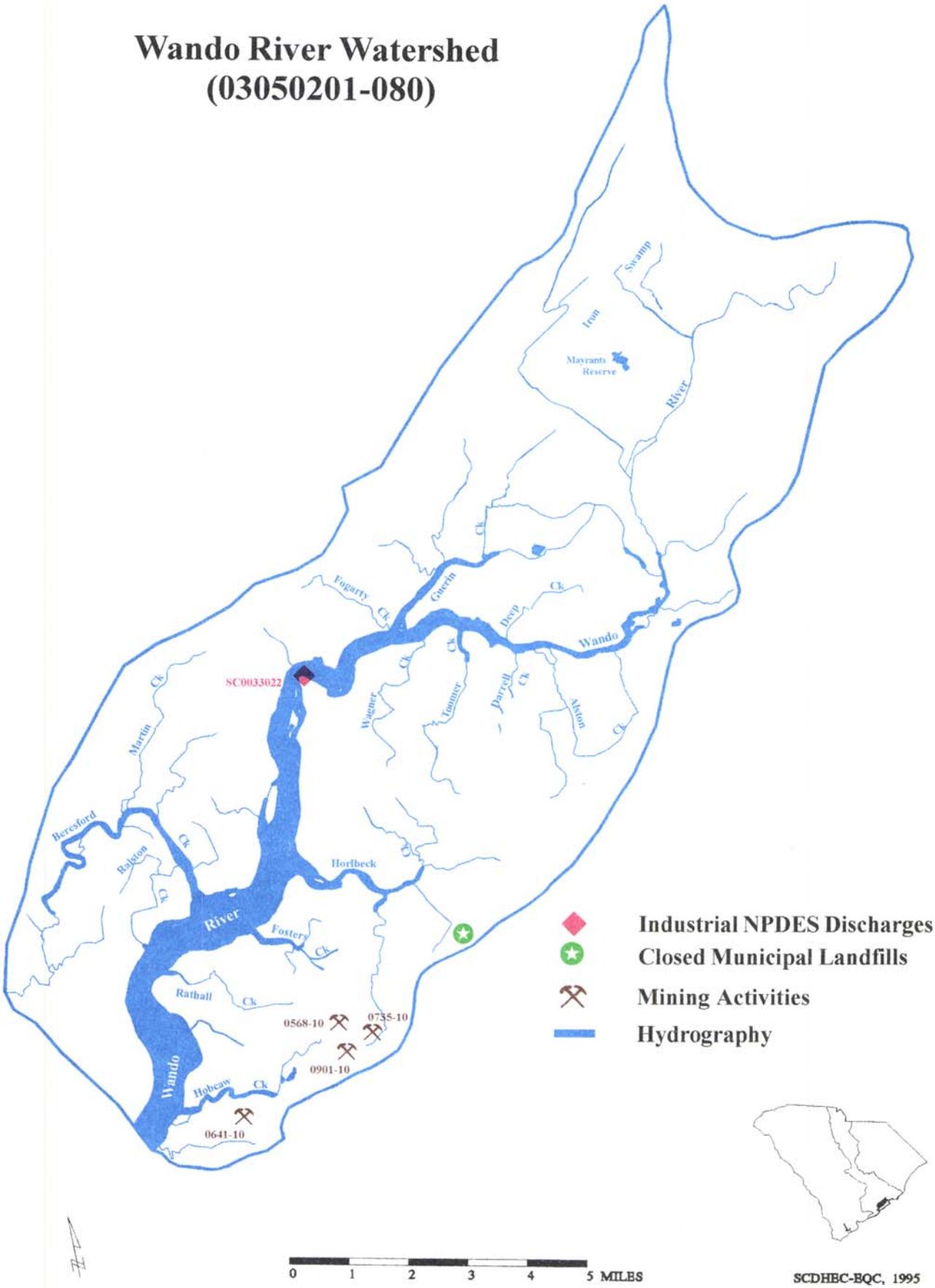
Wando River Watershed
(03050201-080)



SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Wando River Watershed (03050201-080)



03050202-010

(Cypress Swamp)

General Description

Watershed 03050202-010 is located in Berkeley and Dorchester Counties and consists primarily of ***Cypress Swamp*** and its tributaries from its origin to Captains Branch. The watershed occupies 89,873 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Rains-Hobcaw-Lynchburg-Mouzon series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 0.47% urban land, 7.21% agricultural land, 6.40% scrub/shrub land, 0.52% barren land, 72.51% forested land, 12.51% forested wetland, 0.13% nonforested wetland, and 0.26% water.

Williams Branch flows into Big Run and is joined by Black Creek to form Wassamassaw Swamp, which accepts drainage from Mill Branch, Caton Creek, and Simmons Bay. Partridge Creek (Rudd Branch, Mill Branch) joins Wassamassaw Swamp to form the headwaters of the Cypress Swamp. The Cypress Swamp receives drainage from Sandy Run (Smith Branch), Miller Dam Branch, Felder Branch, Dawson Branch, Stanley Branch (Kelly Branch), and Green Bay Branch near the Town of Ridgeville. There are a total of 236.4 stream miles in this watershed, all classified FW.

Water Quality

Cypress Swamp - Aquatic life uses are fully supported, but may be threatened by high and very high concentrations of zinc measured in 1993. Although there were dissolved oxygen excursions, they were typical of values seen in swamp drainages and were considered natural, not standards violations. Recreational uses are fully supported.

Wassamassaw Swamp - Aquatic life uses are fully supported, but may be threatened by an increasing trend in turbidity. Although there were dissolved oxygen excursions, they were typical of values seen in swamp drainages and were considered natural, not standards violations. In sediment, the pesticide mirex was detected in the 1989 sample and P,P'DDT was detected in the 1991 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are only partially supported due to fecal coliform bacteria excursions under Class FW standards.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
STANLEY BRANCH	SC0029858
US FAA/JEDBURG RADAR	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 0.001	WATER QUALITY
WQL FOR BOD_5, NH3-N, TRC, DO	

Nonpoint Source Contributions

Wassamassaw Swamp is listed as waters impacted by unknown nonpoint sources. Water samples collected by the Department indicate elevated levels of toxic materials and ammonia, numerous dissolved oxygen excursions, and scattered elevated levels of nutrients and BOD_5. Wassamassaw Swamp is also included on the §304(l) long list of waters impacted by nontoxics.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
WESTVACO INDUSTRIAL	IWP-090 ACTIVE
BFI MUNICIPAL	DWP-129 CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
ACD, A PARTNERSHIP DANGERFIELD MINE (17A)	0625-08 SAND/CLAY
SALISBURY BRICK CORPORATION NEW HOPE MINE	0722-08 CLAY
BROWNING-FERRIS IND. OF S.ATLANTIC JEDBURG, S-8-16	0837-08 SAND/CLAY
SALISBURY BRICK CORPORATION SALISBURY BRICK MINE	0562-18 CLAY
SALISBURY BRICK CORPORATION RED HILL MINE	0972-18 CLAY
SALISBURY BRICK CORPORATION DUKES MINE	0979-18 CLAY
JOHN R. CUMBIE JOHN R. CUMBIE MINE	0747-08 SAND/CLAY
TRULUCK INDUSTRIES, INC. BERKELEY MINE	0935-08 SAND

Growth Potential

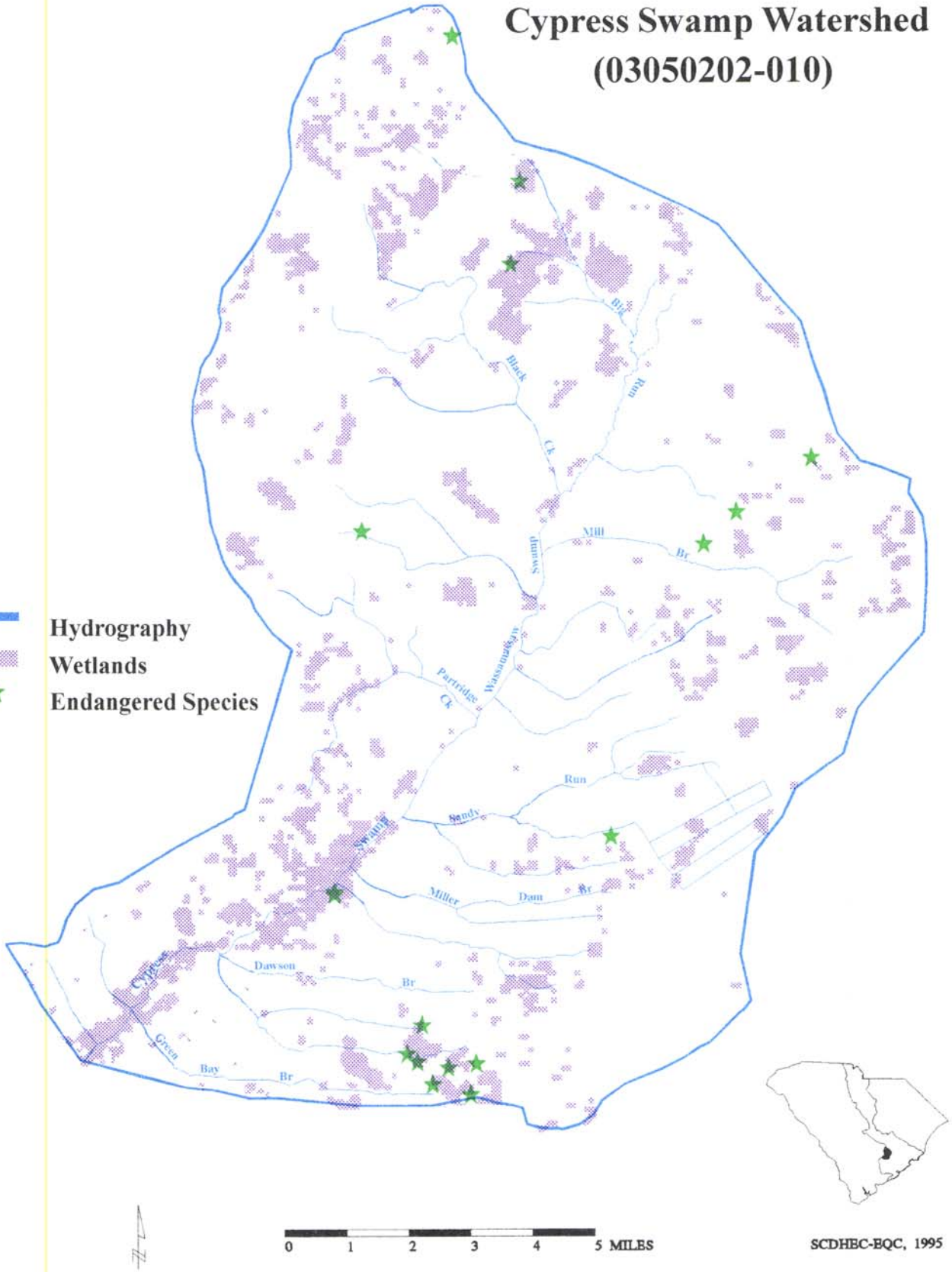
Low density population growth is projected to occur in this watershed in the near future.

Implementation Strategy

Recreational uses are impaired for Wassamassaw Swamp due to elevated fecal coliform from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the water quality impairments and recommend solutions to correct the problem. Cypress Swamp has an elevated concentration of zinc due to unknown sources; an evaluation of this situation is ongoing.

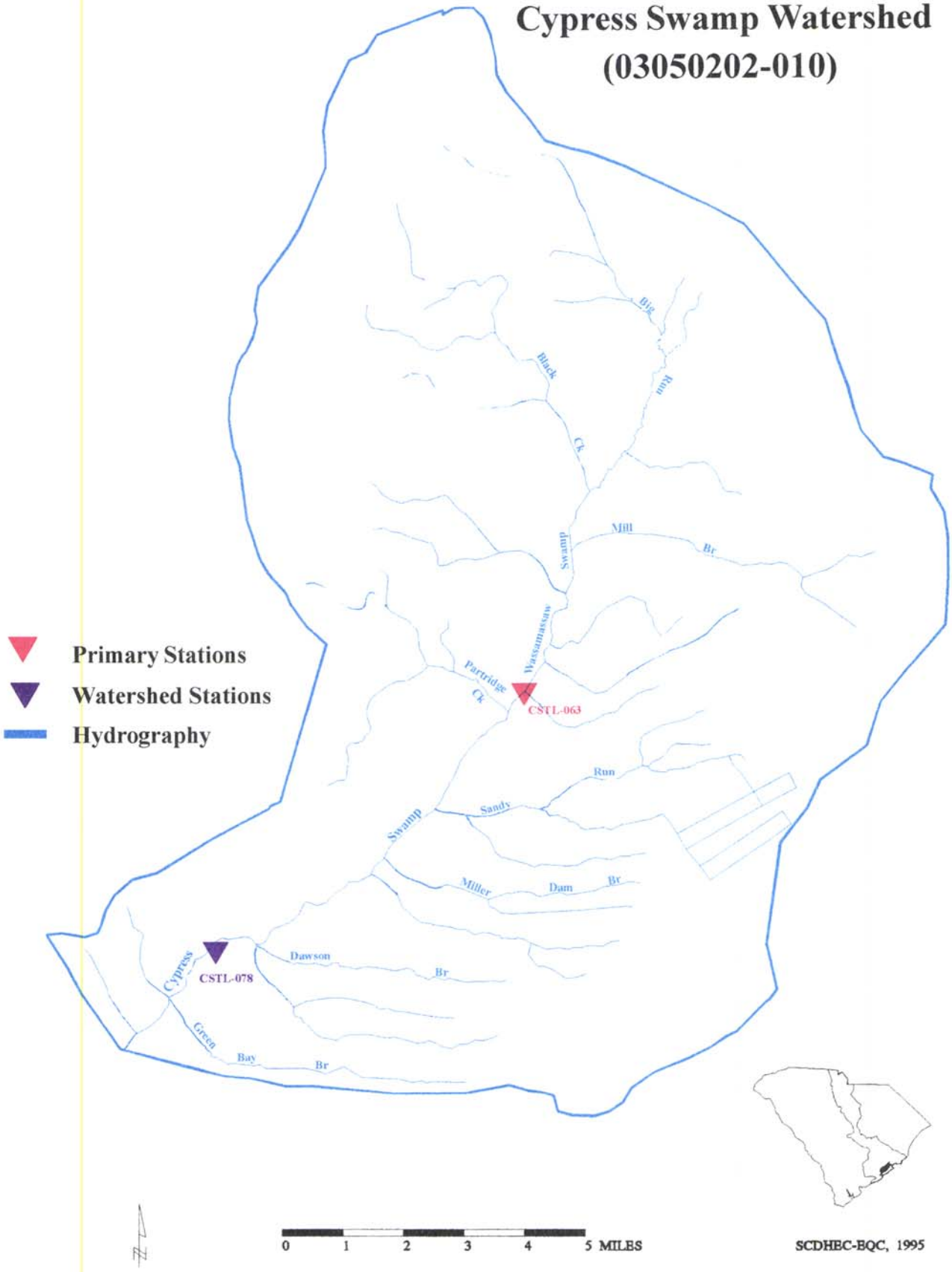
Natural Resources

Cypress Swamp Watershed (03050202-010)



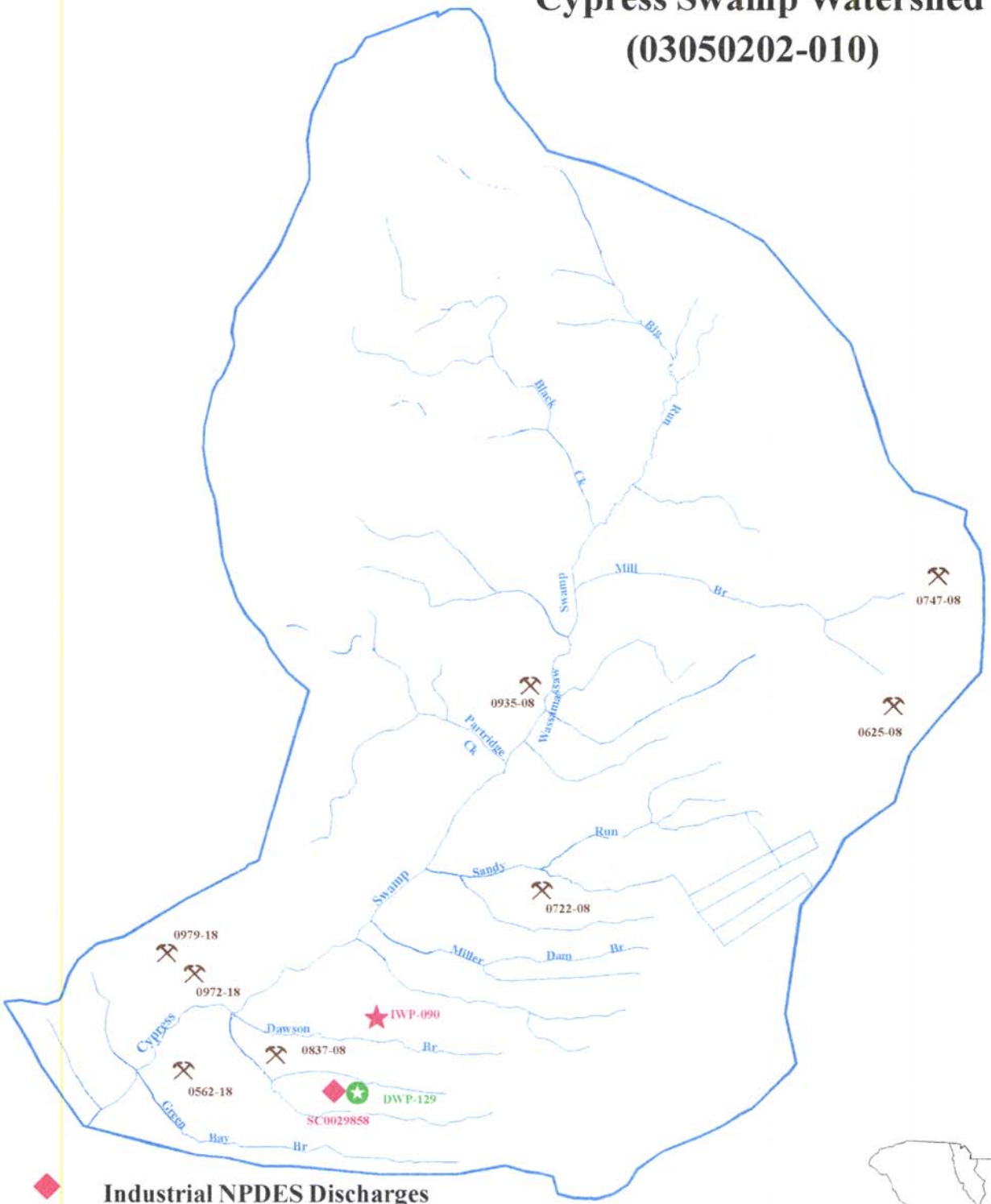
Water Quality Monitoring Stations

Cypress Swamp Watershed (03050202-010)



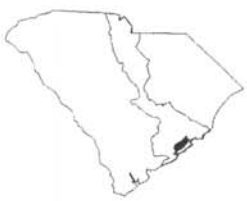
Activities Potentially Affecting Water Quality

Cypress Swamp Watershed (03050202-010)



- Industrial NPDES Discharges
- Closed Municipal Landfills
- Active Industrial Landfills
- Mining Activities
- Hydrography

0 1 2 3 4 5 MILES



SCDHEC-BQC, 1995

03050202-020

(Cypress Swamp/Ashley River)

General Description

Watershed 03050202-020 is located in Dorchester and Berkeley Counties and consists primarily of the ***Cypress Swamp*** and the ***Ashley River*** and their tributaries from Captains Branch to Dorchester Creek. The watershed occupies 69,954 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Daleville-Jedburg-Meggett-Brookman series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 10.27% urban land, 7.37% agricultural land, 8.99% scrub/shrub land, 0.30% barren land, 56.04% forested land, 15.69% forested wetland, 0.94% nonforested wetland, and 0.41% water.

The Cypress Swamp accepts drainage from Captains Creek (McKeown Branch), Platt Branch, Rumphs Hill Creek (Negro Branch), Tina Branch, and Hurricane Branch. The confluence of Cypress Swamp and Hurricane Branch forms the headwaters of the Ashley River near the Town of Summerville. The river then flows through Bobs Lake and Schultz Lake to Bacon Bridge and drains into the lower Ashley River watershed. There are a total of 112.0 stream miles in this watershed, all classified FW.

Water Quality

Ashley River - Aquatic life uses are not supported due to dissolved oxygen excursions, compounded by significantly increasing trends in BOD_5 and turbidity. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
ASHLEY RIVER TEAL-ON-ASHLEY/CWS PIPE #: 001 FLOW: 0.03 WQL FOR NH_3-N,DO,TRC,BOD_5	SC0030350 MINOR COMMUNITY WATER QUALITY
PLATT BRANCH LINQ INDUSTRIAL FABRICS PIPE #: 001 FLOW: M/R	SC0003905 MINOR INDUSTRIAL EFFLUENT
RUMPHS HILL CREEK WESTVACO/KRAFT DIV/SUMMERVILLE PIPE #: 001 FLOW: M/R	SC0044865 MINOR INDUSTRIAL EFFLUENT

Nonpoint Source Contributions

The Ashley River is included on the §304(l) long list of waters impacted by nontoxic pollutants.

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
TIDELAND UTILITIES, INC. TIDELAND FILL PIT	0483-08 SAND/CLAY
MURRAY MINES, INC. MURRAY MINE	0044-18 SAND
TS SMALLS, INC. ACKERMAN PIT	0843-18 SAND
TS SMALLS, INC. 642 PIT	0670-18 SAND/CLAY
SWEAT'S DIRT HAULING, INC. HWY 642 DIRT PIT	0917-18 SAND/CLAY
SWEAT'S DIRT HAULING, INC. HWY 61 DIRT PIT	0887-18 SAND/CLAY
SWEAT'S DIRT HAULING SWEAT'S DIRT PIT	0816-18 SAND/CLAY

Growth Potential

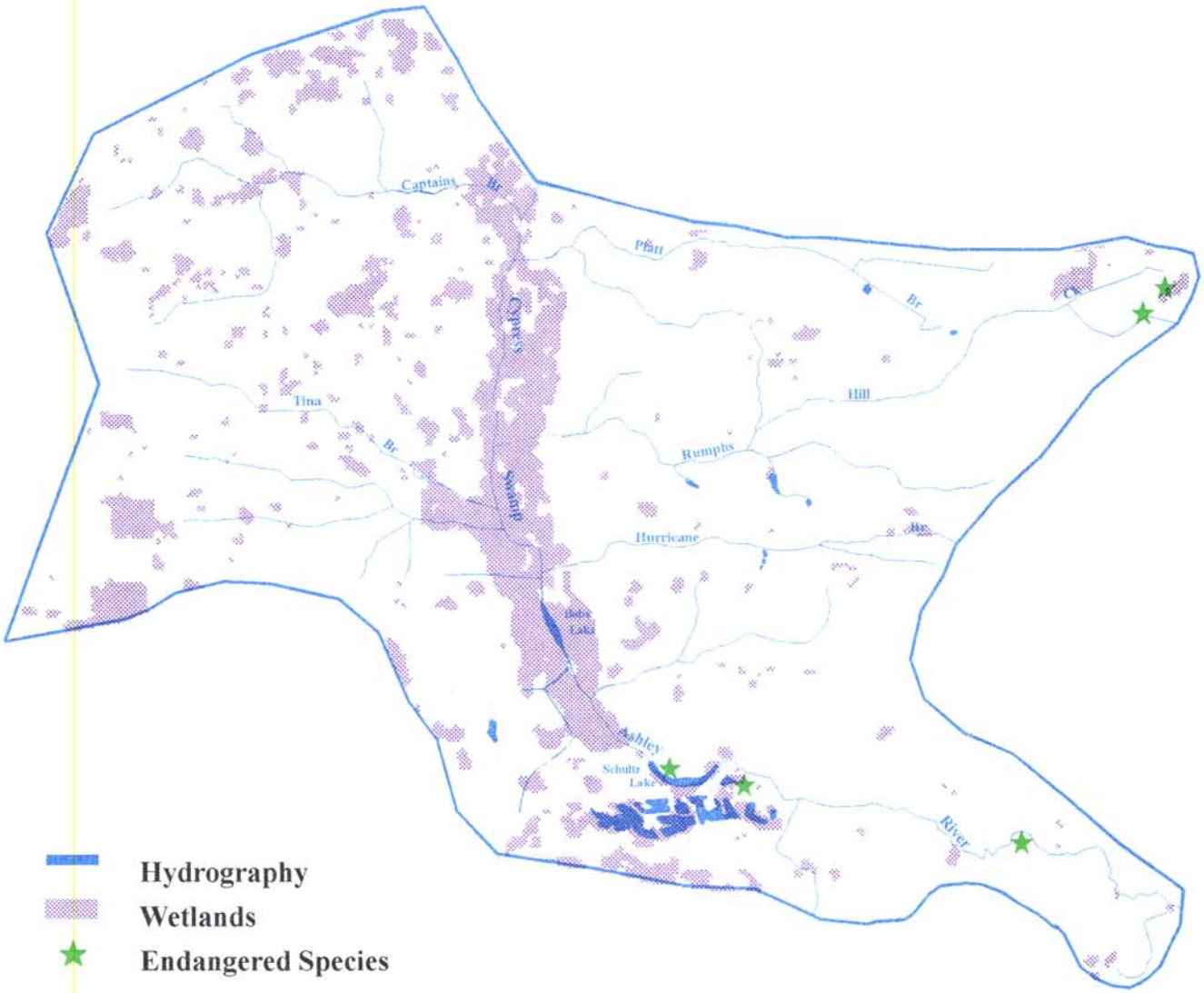
The areas of high development and growth include Scotch Range, Summerset Acres, Walnut Farms, Westoe Plantation, Indian Springs, Pine Hill Acres, and the Pine Forest Country Club. Both water and sewer services are available to these growth areas.

Implementation Strategy

Aquatic life and recreational uses are impaired by low dissolved oxygen and elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

Natural Resources

Cypress Swamp/Ashley River Watershed (03050202-020)



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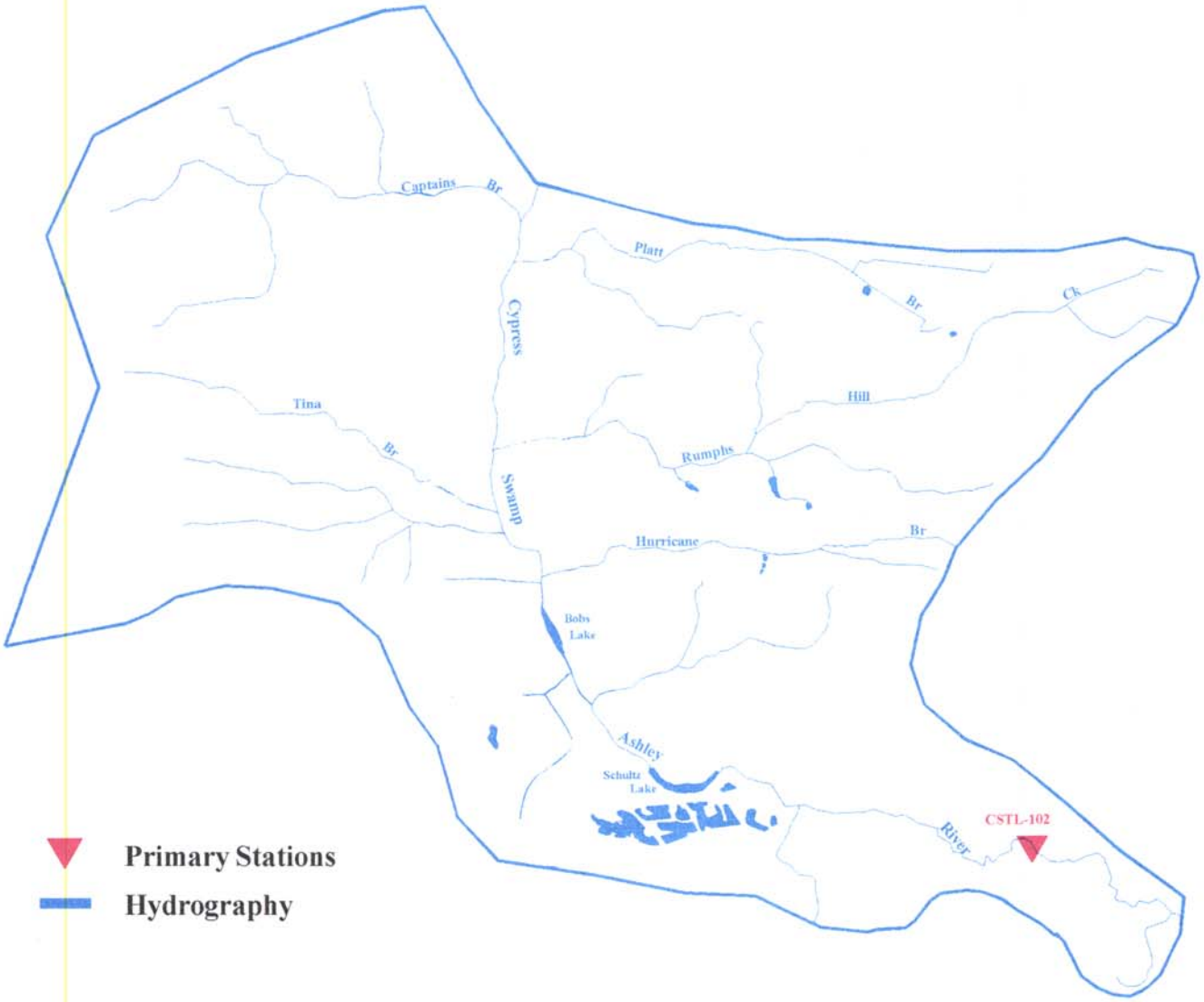
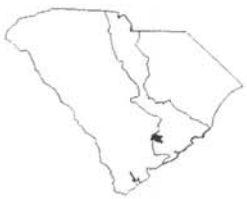
SCDHEC-BQC, 1995

Water Quality Monitoring Stations

Cypress Swamp/Ashley River Watershed
(03050202-020)



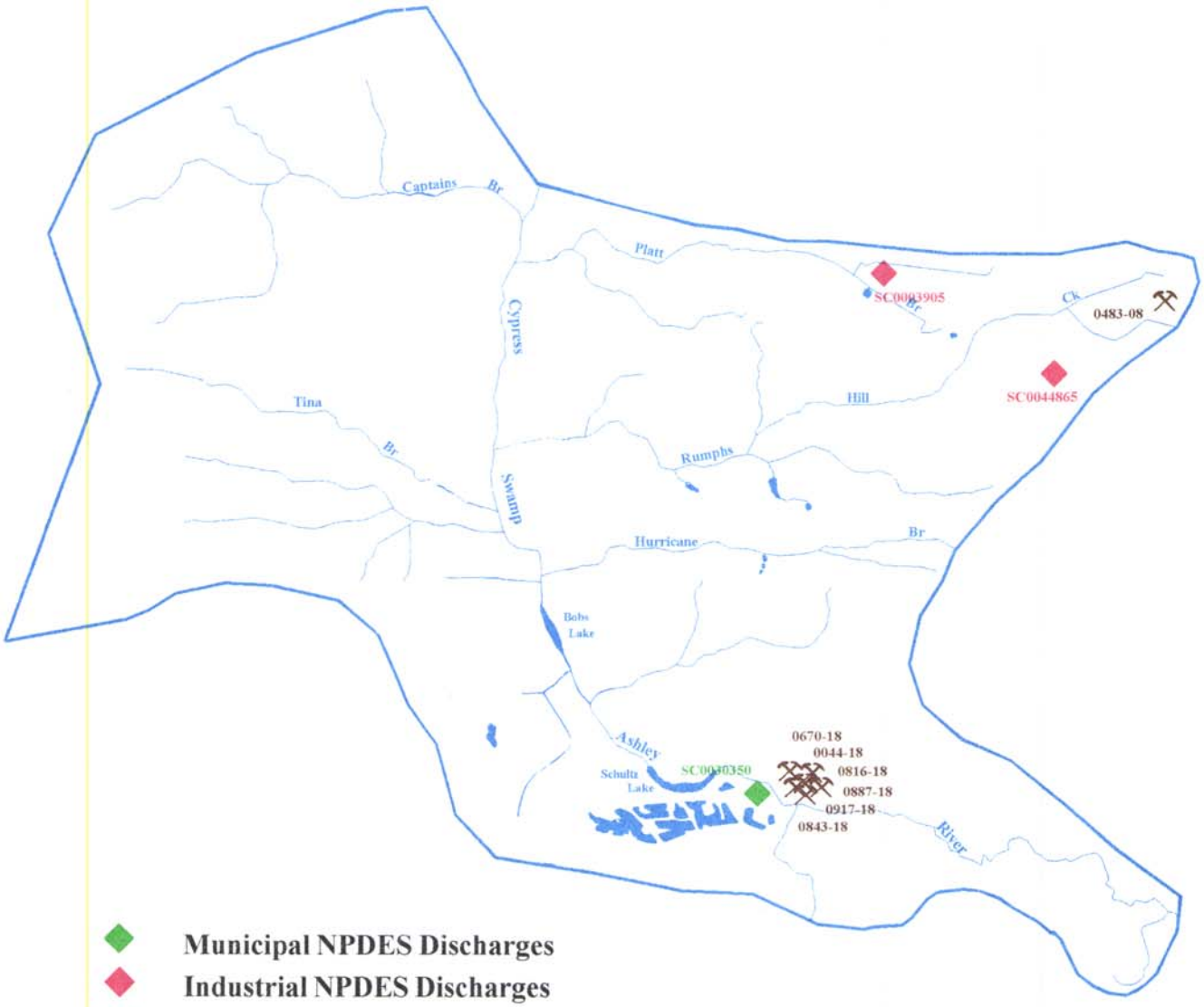


0 1 2 3 4 5 MILES

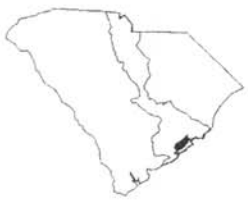
SCDHEC-BQC, 1995

Activities Potentially Affecting Water Quality

Cypress Swamp/Ashley River Watershed (03050202-020)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Mining Activities
- Hydrography



0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

03050202-030

(Dorchester Creek/Eagle Creek)

General Description

Watershed 03050202-030 is located in Berkeley, Charleston, and Dorchester Counties and consists primarily of ***Dorchester Creek and Eagle Creek*** and their tributaries. The watershed occupies 24,255 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Yauhannah-Yemassee-Meggett-Brookman series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 1%, with a range of 0-6%. Land use/land cover in the watershed includes: 44.73% urban land, 4.19% agricultural land, 4.06% scrub/shrub land, 0.21% barren land, 26.93% forested land, 19.72% forested wetland, and 0.17% water.

Saw Mill Branch (Limehouse Branch, Stroberfield Branch) flows past the Town of Summerville and is joined by Rose Creek to form Dorchester Creek, which flows into the Ashley River. Limehouse Branch is connected to Ancrum Swamp in watershed 03050201-070. Eagle Creek accepts drainage from Chandler Bridge Creek, Spencer Branch, and Federwitz Branch before draining into the Ashley River. There are a total of 31.7 stream miles in this watershed, all classified SA.

Water Quality

Dorchester Creek - Aquatic life uses are only partially supported due to dissolved oxygen excursions. Although pH excursions occurred, the presence of significant phytoplankton communities suggests they are natural in origin, and do not constitute standards violations. A high concentration of zinc was measured in water in 1993. In the 1991 sediment sample, P,P'DDT was detected. Although the use of DDT was banned in 1973, it is very persistent in the environment. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions. Recreational uses are not supported due to fecal coliform bacteria excursions, although a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions.

Sawmill Branch - This creek was Class B until April, 1992 and bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Aquatic life uses are not supported due to dissolved oxygen excursions, compounded by a significantly decreasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards, although a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions.

Eagle Creek - This creek was Class SB* until April, 1992. Aquatic life uses are fully supported. Although pH excursions occurred, the presence of significant phytoplankton communities suggests they are natural in origin, and do not constitute standards violations. Recreational uses are not

supported due to fecal coliform bacteria excursions under new Class SB standards, although a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions.

Activities Potentially Affecting Water Quality

Point Source Contributions

Sawmill Branch is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen and fecal coliform concerns.

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION (EL/WQL)*
COMMENT	
SAWMILL BRANCH TRIB	SC0041611
PANTRY #593/SUMMERVILLE	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	WATER QUALITY
WQL FOR TOXICS	

Nonpoint Source Contributions

Eagle Creek is included on the §319 list of waters impacted by urban runoff. Water samples collected by the Department indicate elevated fecal coliform levels on numerous occasions.

Dorchester Creek/Sawmill Branch Watershed Project

This watershed drains the land area around the Town of Summerville, a rapidly urbanizing region. The project commenced in FY-1994, and will demonstrate streamside restoration BMPs and monitor their effects on water quality. It will also employ simulation models to target areas in the watershed for future remediation and as an aid in determining which type of management would be most effective. Recommendations will be made to local governments. The project is expected to run for four years.

Landfill Activities

SOLID WASTE LANDFILL NAME	*PERMIT #*
FACILITY TYPE	*STATUS*
TOWN OF SUMMERVILLE	----
MUNICIPAL	CLOSED
SMITH STREET	----
MUNICIPAL	CLOSED

Mining Activities

MINING COMPANY	*PERMIT #*
MINE NAME	*MINERAL*
SALISBURY BRICK CORPORATION	0549-08
SALISBURY BRICK MINE	CLAY

Growth Potential

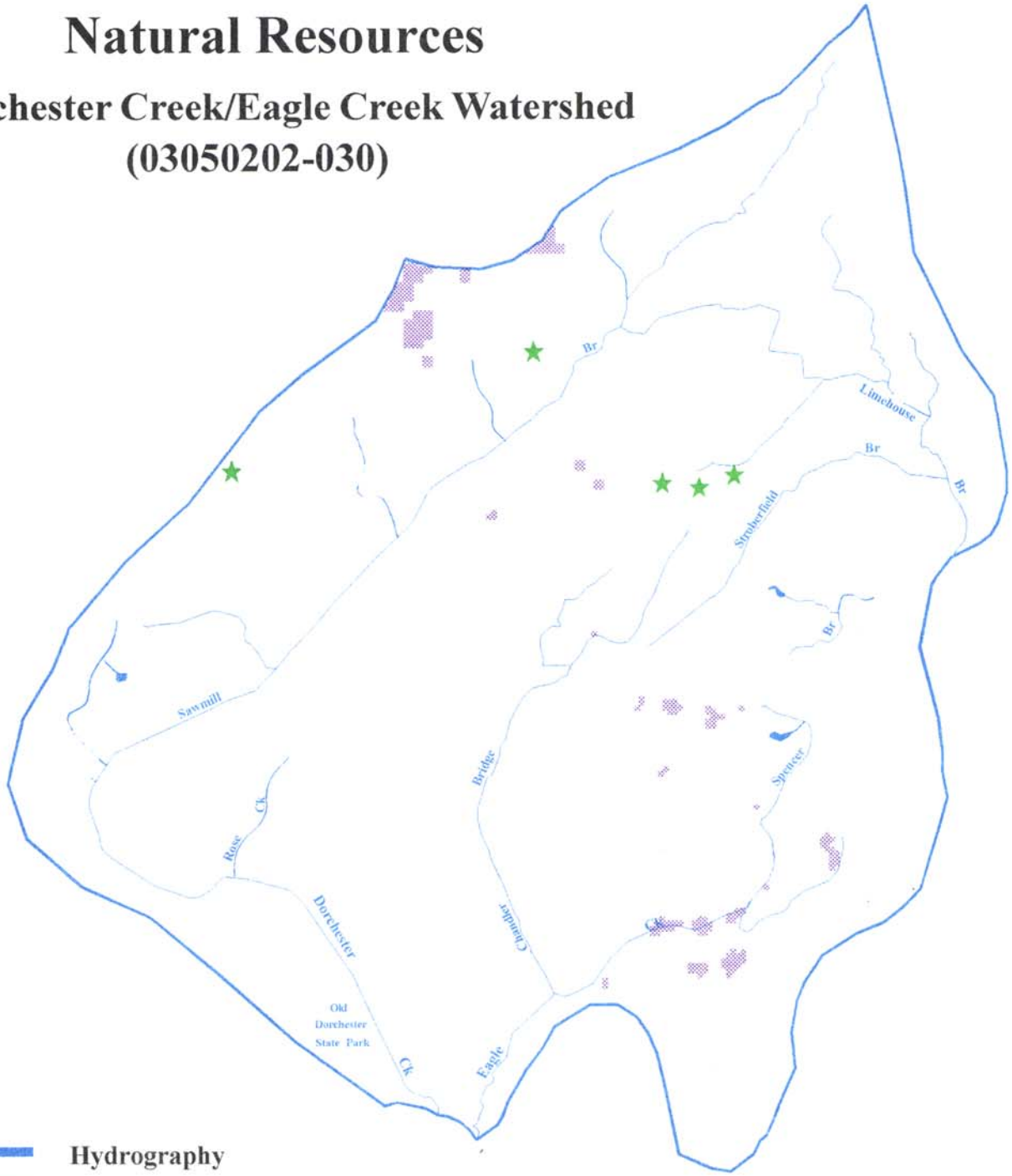
The areas of high development and growth include Newington, Woodland, Brandy Mill, Gahagan Estates in Dorchester County; and South Pointe, Ashley Square, and Tramway in Berkeley County. Both water and sewer services are available to these growth areas.

Implementation Strategy

Aquatic life uses for Sawmill Branch are impaired due to low dissolved oxygen concentrations from point sources. The permits for these dischargers are being revised and the plants are being upgraded; the bacterial condition is expected to improve with the new NPDES permit limits. Aquatic life and recreational uses are impaired for Dorchester Creek, Sawmill Branch, and Eagle Creek due to low dissolved oxygen and elevated fecal coliform bacteria concentrations from nonpoint sources. The Department's Watershed Implementation Staff will determine, where possible, the sources of the water quality impairments and recommend solutions to correct the problem.

Natural Resources

Dorchester Creek/Eagle Creek Watershed (03050202-030)



Hydrography

Wetlands

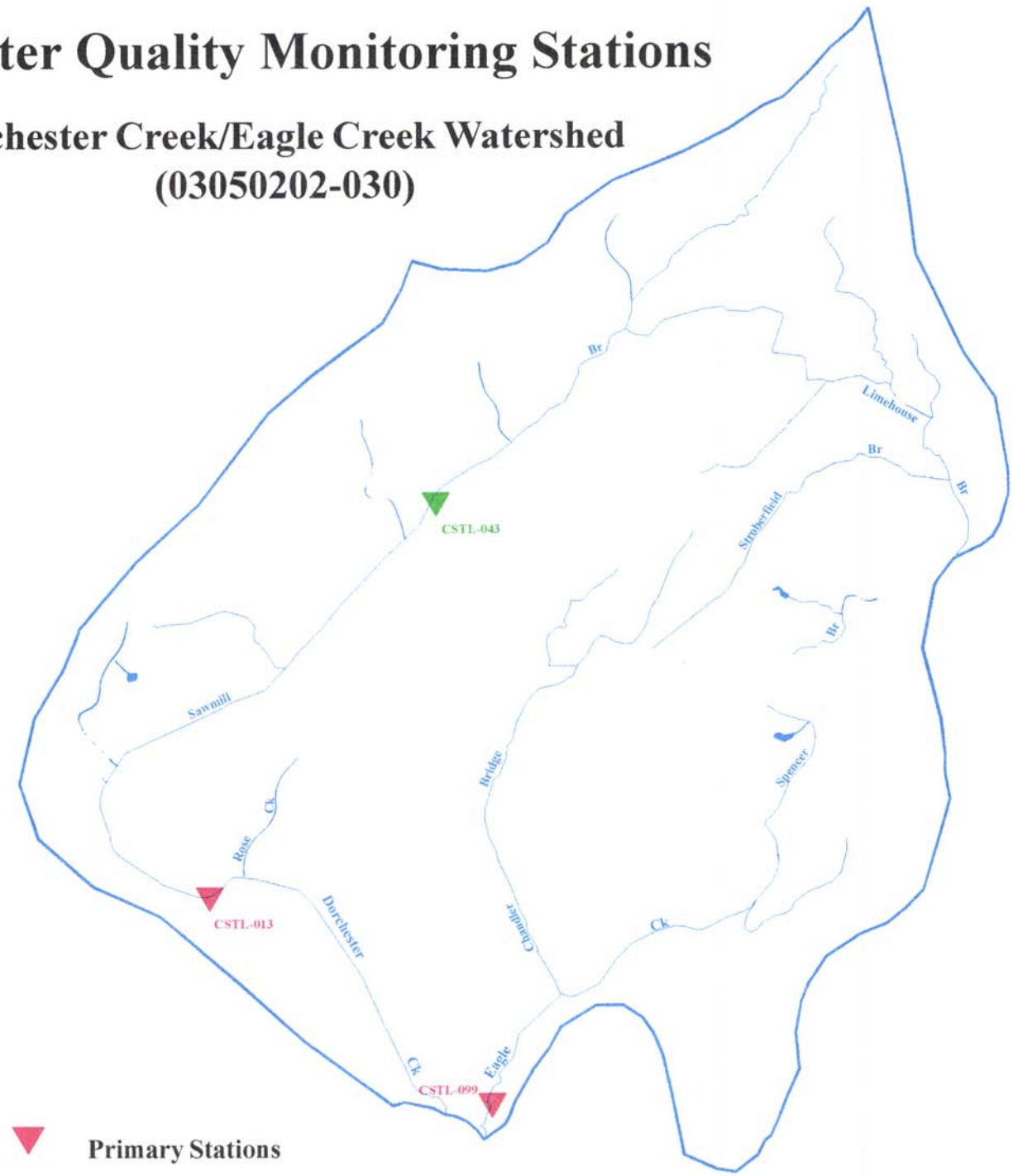
Endangered Species

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

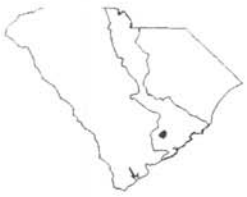
Dorchester Creek/Eagle Creek Watershed (03050202-030)



Primary Stations

Secondary Stations

Hydrography

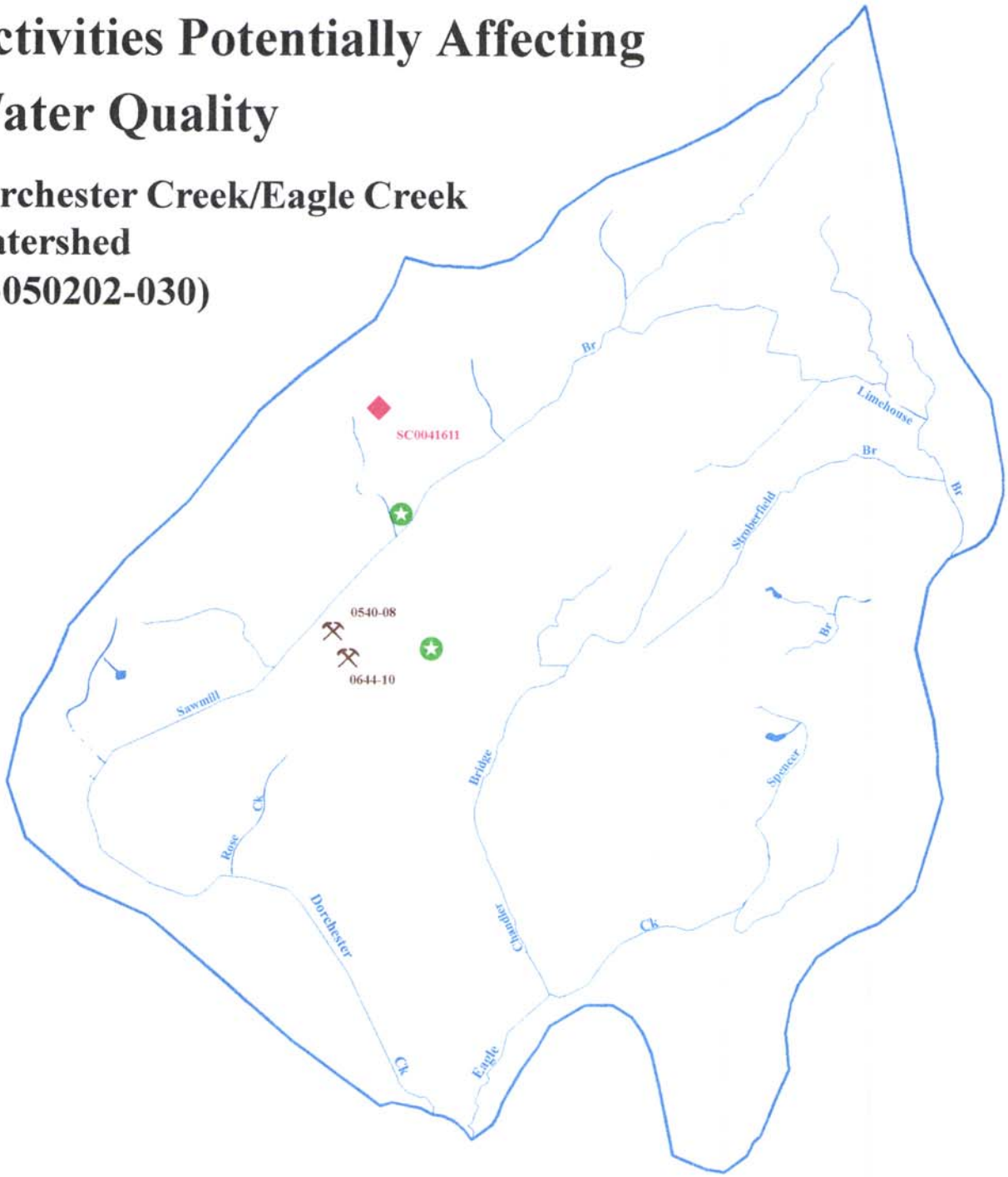


0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Dorchester Creek/Eagle Creek Watershed (03050202-030)



- Industrial NPDES Discharges
- Closed Municipal Landfills
- Mining Activities
- Hydrography

0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050202-040

(Ashley River)

General Description

Watershed 03050202-040 is located in Dorchester and Charleston Counties and consists primarily of the ***Ashley River*** and its tributaries from Dorchester Creek to the Charleston Harbor. The watershed occupies 47,930 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Bohicket-Udorthents-Udipsamments-Yonges series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 45.86% urban land, 0.30% agricultural land, 1.07% scrub/shrub land, 0.01% barren land, 28.30% forested land, 4.69% forested wetland, 12.60% nonforested wetland, and 7.17% water.

This segment of the Ashley River originates at Bacon Bridge and accepts drainage from the Dorchester Creek watershed (03050202-030). The river then flows past the Old Dorchester State Park and Middleton Gardens to receive drainage from Coosaw Creek, Olive Branch, and Sawpit Creek. Popperdam Creek enters the river near Magnolia Gardens, the Charleston U.S. Air Force Base, and the Municipal Airport. Further downstream, MacBeth Creek enters the river followed by Keivling Creek and Church Creek. The Ashley River is classified SA from Bacon Bridge to Church Creek, where it changes from SA to SA* (DO not less than 4 mg/l) and remains SA* to the entrance of Orangegrove Creek (Oldtown Creek). Between Church Creek and Orangegrove Creek, the Ashley River receives drainage from Bulls Creek, Brickyard Creek, and Duck Island Canal. A Brickyard Creek tributary is classified SB. Downstream of Orangegrove Creek, the Ashley River reverts its classification to SA and drains into the Charleston Harbor and the Atlantic Ocean. In addition to the Old Dorchester State Park and the historic gardens and plantations, another natural resource in the watershed is the historic Charles Towne Landing State Park on the Ashley River near Bulls Creek. There are a total of 13.8 stream miles in this watershed, and 13.9 square miles of estuarine areas.

Water Quality

Ashley River - There are four SCDHEC monitoring sites along this section of the Ashley River. Although low dissolved oxygen and pH are typical of tidally influenced systems with significant marsh drainage, the occurrence of decreasing trends and an increasing frequency of low values seen at several of the sites suggests potential developing problems. Aquatic life uses are not supported at the furthest upstream site (Magnolia Gardens) due to dissolved oxygen excursions, compounded by significantly decreasing trends in dissolved oxygen concentration and pH. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentrations.

Aquatic life uses are not supported at station MD-242 due to dissolved oxygen excursions. Recreational uses are not supported due to fecal coliform bacteria excursions. Aquatic life uses are also not supported at station MD-135 due to dissolved oxygen excursions, compounded by a

significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Aquatic life uses are not supported again at station MD-052 due to dissolved oxygen excursions, compounded by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. In the 1990 sediment sample, a high concentration of nickel was measured and the pesticide phosdrin was detected at a concentration well above the detection limit. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Aquatic life uses are fully supported at the river mouth to the harbor, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Although this site is actually located in watershed 03050202-070, it best represents the water quality in the lower Ashley River. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Church Creek - Aquatic life uses are fully supported. Recreational uses are not supported due to fecal coliform bacteria excursions.

Charles Towne Landing State Park Pond - The pond has been treated annually in the past five years with aquatic herbicides in an attempt to control the growth of aquatic macrophytes that have impaired bank fishing and boating access. *Tilapia* were introduced in 1991, by the Water Resources Division of the SCDNR, at a stocking rate of 200 fish/vegetated acre for a total of 1000 fish. The fish were restocked at the same rate and numbers in 1992 and 1993. And were stocked again in 1994 without the accompaniment of herbicide treatment.

Special Water Quality Study on the Ashley River

A special study of the Ashley River was conducted in July, 1990 with the cooperation of USEPA Region IV Ecological Support Branch personnel. The study included measurement of sediment oxygen demand, nutrients, chlorophyll-a, and algal growth potential tests (AGPT). The AGPT results showed elevated to high levels, and chlorophyll-a concentrations were extremely high compared to other South Carolina samples. The results of the nutrient samples led one USEPA scientist to state, "The very high levels of total nitrogen and phosphorus indicated a grossly enriched environment in the area of sampled stations." Total phosphorus concentrations from ambient monitoring stations are consistently in the top ten percent of the values observed throughout South Carolina coastal waters.

Activities Potentially Affecting Water Quality

Point Source Contributions

The Ashley River is included on the §303(d) high priority list of waters targeted for TMDL development related to concerns for dissolved oxygen, fecal coliform, nutrients, pH, and toxics.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
ASHLEY RIVER SCE&G/HAGOOD STATION PIPE #: 002 FLOW: M/R	SC0002011 MINOR INDUSTRIAL EFFLUENT
ASHLEY RIVER G&S ROOFING PRODUCTS PIPE #: 001,002 FLOW: M/R	SC0002771 MINOR INDUSTRIAL EFFLUENT
ASHLEY RIVER TRIBS US AIR FORCE/CHAS.BASE PIPE #: 001,003,007,009,010 FLOW: M/R	SC0003921 MINOR INDUSTRIAL EFFLUENT
ASHLEY RIVER CITY OF CHARLESTON/PLUM IS. PIPE #: 001 FLOW: 27.0	SC0021229 MAJOR MUNICIPAL EFFLUENT
ASHLEY RIVER KINGS GRANT ON ASHLEY PIPE #: 001 FLOW: 0.238 WQL FOR TRC,NH_3-N,DO	SC0021911 MINOR COMMUNITY WATER QUALITY
ASHLEY RIVER ROBERT BOSCH CORP. PIPE #: 001 FLOW: M/R WQL FOR TRC	SC0022951 MINOR INDUSTRIAL WATER QUALITY
ASHLEY RIVER CUMMINS ENGINE CO. PIPE #: 001 FLOW: M/R	SC0028428 MINOR INDUSTRIAL EFFLUENT
ASHLEY RIVER TOWN OF SUMMERVILLE/OX POND PIPE #: 001 FLOW: 10.0 WQL FOR NH3-N,DO,TRC,BOD5	SC0037541 MAJOR MUNICIPAL WATER QUALITY
ASHLEY RIVER MIDDLETON INN & SD PIPE #: 001 FLOW: 0.014 WQL FOR TRC	SC0039063 MINOR COMMUNITY WATER QUALITY
ASHLEY RIVER PANTRY #596 PIPE #: 001 FLOW: M/R WQL FOR BOD5,TOXICS	SC0042480 MINOR INDUSTRIAL WATER QUALITY

ASHLEY RIVER AMERADA HESS #40260 PIPE #: 001 FLOW: M/R WQL FOR BOD5,TOXICS	SC0044202 MINOR INDUSTRIAL WATER QUALITY
ASHLEY RIVER AMERADA HESS #40221 PIPE #: 001 FLOW: M/R WQL FOR BOD5,TOXICS	SC0044962 MINOR INDUSTRIAL WATER QUALITY
BRICKYARD CREEK G&S ROOFING PRODUCTS PIPE #: 003 FLOW: M/R	SC0002771 MINOR INDUSTRIAL EFFLUENT
BRICKYARD CREEK LOCKHEED AERONAUTICAL SYSTEMS PIPE #: 001,002,003,004 FLOW: M/R	SC0001007 MINOR INDUSTRIAL EFFLUENT
CHURCH CREEK CHARLESTON CPW/PIERPONT PLT PIPE #: 001 FLOW: 1.5 WQL FOR NH3-N,DO,TRC	SC0026069 MAJOR MUNICIPAL WATER QUALITY
COOSAW SWAMP DORCHESTER PUB.WKS./LOWER DORCHESTER PLT PIPE #: 001 FLOW: 4.0 WQL FOR BOD5,NH3-N,D0,TRC	SC0038822 MAJOR MUNICIPAL WATER QUALITY

The Charleston Harbor Project

One facet of the Charleston Harbor Project (CHP) is its modeling effort in the Ashley River. Working in conjunction with the Department, the University of South Carolina, Clemson University, and the United States Geological Survey (USGS), the projects goal is to develop a tool for the Department's use in point source wasteload allocation and Total Maximum Daily Load (TMDL) determination. The modeled domain encompasses the Cooper River and its major tributaries from Pinopolis Dam to its confluence with the Wando River, the Wando River from its headwaters to the confluence with the Cooper River, and the Ashley River from Bacon Bridge downstream to the Highway 17 Bridge. Hydrodynamics are modeled using the one-dimensional BRANCH model (Schaffranek et al. 1981) while water quality is modeled using the one-dimensional Branched Lagrangian Transport Model (Jobson and Schoelhammer 1987). The model is calibrated and verified to salinity, dissolved oxygen, carbonaceous biochemical oxygen demand (CBOD), ammonia, organic nitrogen, nitrate, and algae as chlorophyll-a. Calibration and verification data were collected in May and August of 1993 by the Department and the USGS.

Nonpoint Source Contributions

The Ashley River is included on the §319 list of waters impacted by urban runoff. Water samples collected by the Department from the upstream and midstream sites indicate numerous excursions of fecal coliform and dissolved oxygen. Water samples collected from the downstream

sites also indicate numerous excursions of fecal coliform and dissolved oxygen, together with scattered elevated levels of toxic materials and turbidity. The Ashley River is also included on the §304(l) long list of waters impacted by nontoxic pollutants.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
MOORE DRUM INDUSTRIAL	—— CLOSED
AZALEA ROAD MUNICIPAL	—— CLOSED
WESTOE PLANTATION INDUSTRIAL	IWP-238 ACTIVE
BEES FERRY #2 MUNICIPAL	DWP-083 ACTIVE
G&S ROOFING PRODUCTS INDUSTRIAL	IWP-162 ACTIVE
CITY OF CHARLESTON MUNICIPAL	—— CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
TRULUCK CONSTRUCTION CO., INC. PLANT SITE	0196-10 SAND
WINDSOR HILLS PLANTATION WINSOR HILLS MINE	0611-10 SAND
CROSS COUNTY LAND & DEVELOPMENT CO. CROSS COUNTY MINE	0374-10 SAND/CLAY
CROSS CREEK INVESTORS, A PARTNERSHIP CROSS CREEK MINE	0425-10 SAND/CLAY

Ground Water Concerns

The ground water in the vicinity of the property owned by Koppers-Charleston (formerly Beazer East) is contaminated with volatile and nonvolatile organics (Creosote). The source of the contamination includes surface impoundments, above ground storage tanks, spills/leaks, and unpermitted disposals. The facility is currently in the assessment phase and enforcement action is pending. The surface water affected by the ground water contamination is the Ashley River. The ground water in the vicinity of the property owned by the Milford Street Site is contaminated with

nonvolatile organics from unknown sources. The facility is currently in the assessment phase. The surface water affected by the ground water contamination is a ditch draining to the Ashley River.

Growth Potential

The west bank of the Ashley River contains numerous historic structures including Middleton Place, Drayton Hall, Magnolia Gardens, Runnymead Plantation, and Charlestown Landing State Park; all are important scenic, cultural, and tourism resources. Areas with a high potential for growth include Amberwood, Jerico on the Ashley, Summerfield, River Oaks, and Shadowmoss in Charleston County; and Coosaw Creek, Whitehall, Avanti Tract, Appian Landing, Bakers Landing, Indigo Fields, and Ricefield/Windsor Hill in Dorchester County. There is water and sewer services available to all these growth areas.

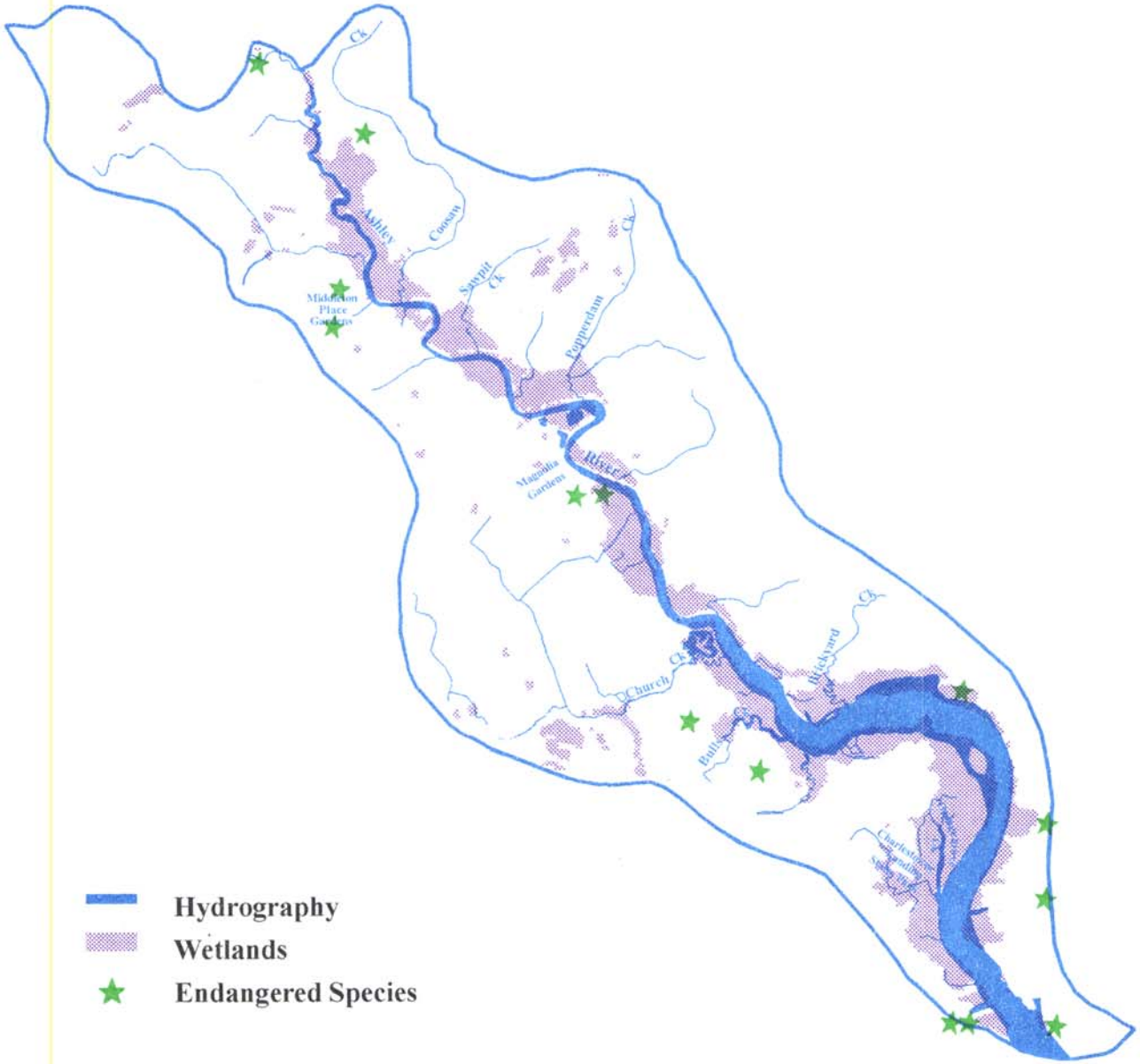
Implementation Strategy

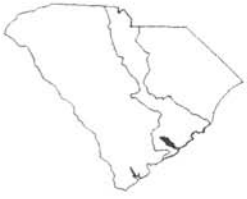
Aquatic life and recreational uses for the Ashley River are impaired due to low dissolved oxygen and elevated fecal coliform bacteria concentrations from point and nonpoint sources. The permits for these dischargers are being revised and the plants upgraded; the bacterial condition is expected to improve with the new NPDES permit limits. The Department's Watershed Implementation Staff will determine, where possible, the nonpoint source water quality impairments and recommend solutions to correct the problem. An additional impairment to the Ashley River is the introduction of ground water contaminated with organics. The facility involved is currently in the assessment phase with enforcement pending.

Recreational uses for Church Creek are impaired due to elevated fecal coliform bacteria concentrations from point and nonpoint sources. The permits for these dischargers are being revised and the plants upgraded; the bacterial condition is expected to improve with the new NPDES permit limits. The Department's Watershed Implementation Staff will determine, where possible, the nonpoint source water quality impairments and recommend solutions to correct the problem.

Natural Resources

Ashley River Watershed
(03050202-040)



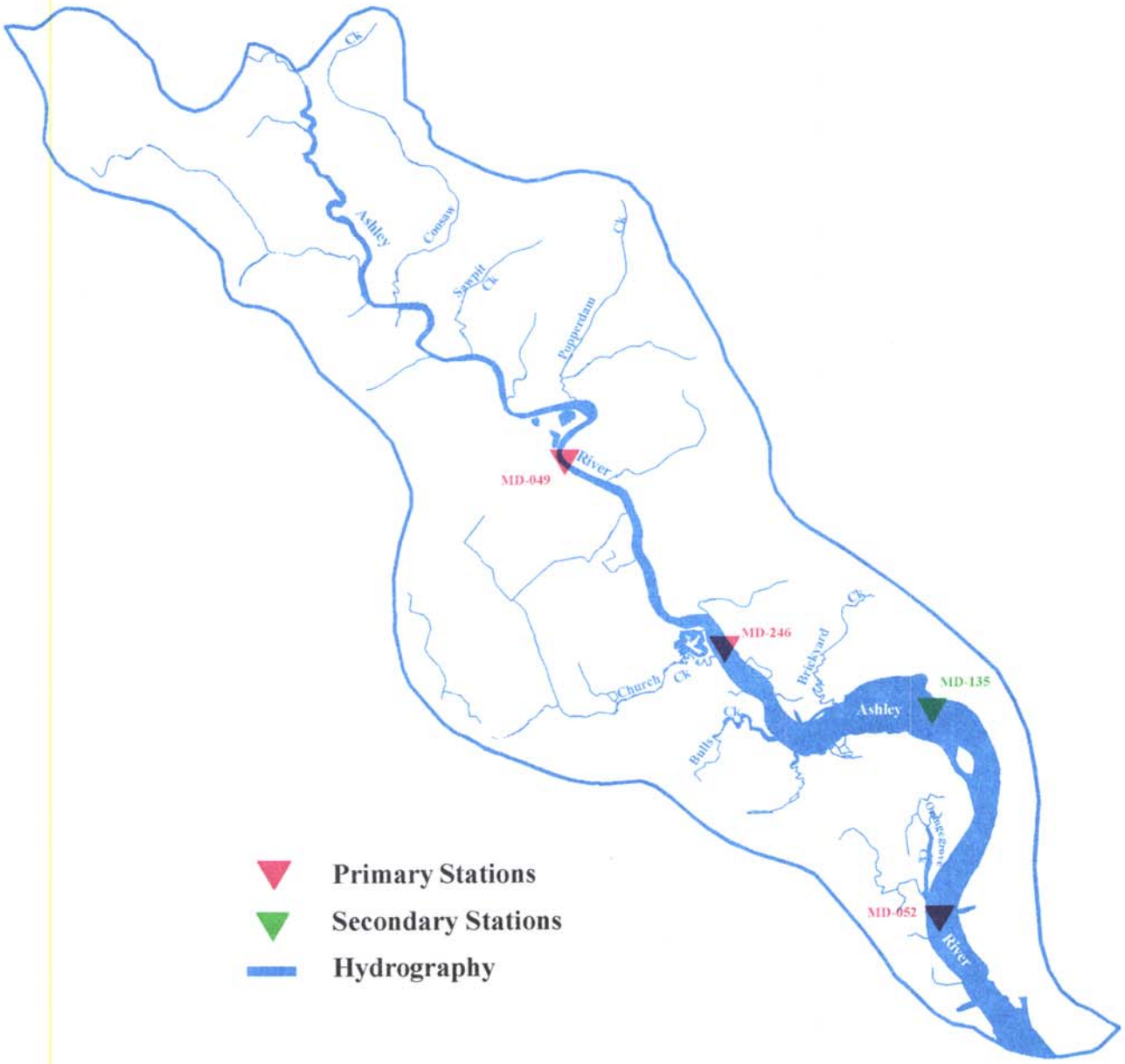


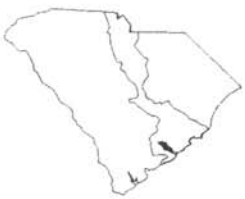
0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Ashley River Watershed
(03050202-040)





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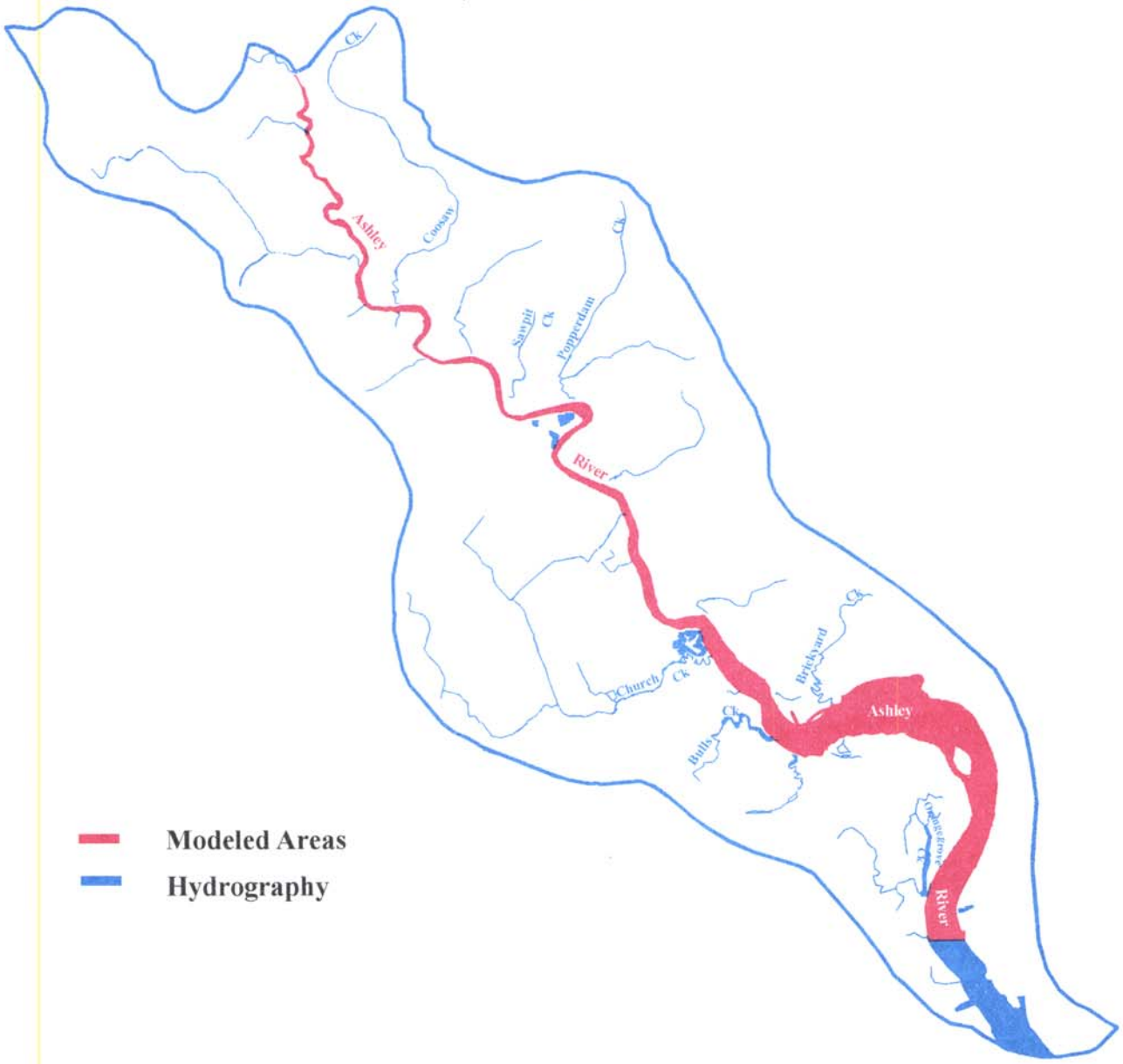
SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Ashley River Watershed
(03050202-040)

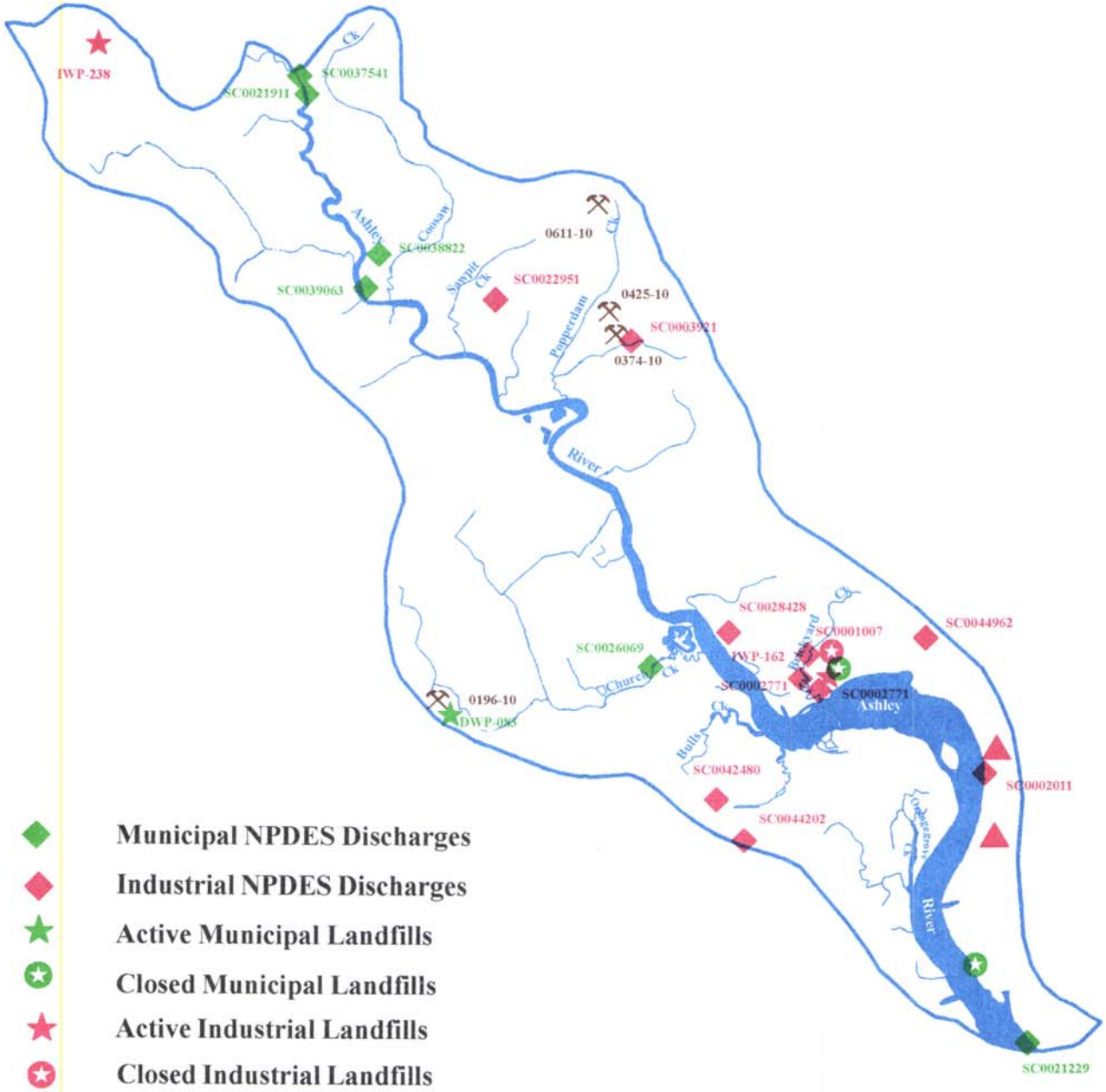


0 1 2 3 4 5 MILES

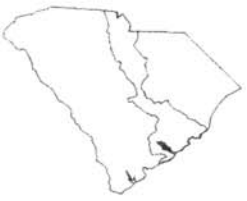
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Ashley River Watershed
(03050202-040)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Active Municipal Landfills
- Closed Municipal Landfills
- Active Industrial Landfills
- Closed Industrial Landfills
- Mining Activities
- Ground Water Contamination Sites
- Hydrography



0 1 2 3 4 5 MILES

SCDHEC-EQC, 1995

03050202-050

(Stono River)

General Description

Watershed 03050202-050 is located in Dorchester and Charleston Counties and consists primarily of the ***Stono River*** and its tributaries from Log Bridge Creek to Wappoo Creek. The watershed occupies 145,503 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Meggett-Brookman-Bladen-Chisolm series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 1%, with a range of 0-6%. Land use/land cover in the watershed includes: 5.27% urban land, 1.73% agricultural land, 9.48% scrub/shrub land, 0.11% barren land, 66.53% forested land, 7.10% forested wetland, 7.13% nonforested wetland, and 2.64% water.

This segment of the Stono River runs from Log Bridge Creek (near to its connection with the Saluda-Edisto Basin) to Wappoo Creek (which connects to the Ashley River), and drains into the lowest segment of the Stono River. Scotts Branch flows into Fishburne Creek which in turn flows into Horse Savanna and Rantowles Creek. Rantowles Creek accepts drainage from the Wallace River (Caw Caw Swamp, Drayton Swamp, Caddin Bridge Swamp) and then flows into the Stono River. Log Bridge Creek (Middle Branch, Melechamp Branch) also flows into the Stono River and shares drainage with the Wallace River. This section of the Stono River is classified FW. Downstream from the SCL Railroad Bridge, the Stono River is classified SFH, and incorporates the drainage of Long Branch Creek, Sandy Bay, and Elliott Cut (Wappoo Creek). There are a total of 502.9 stream miles in this watershed and 8.6 square miles of estuarine areas.

Water Quality

Stono River - Aquatic life uses are fully supported, but may be threatened by significantly decreasing trends in dissolved oxygen concentration and pH, and a significantly increasing trend in turbidity. Although dissolved oxygen excursions occurred, they are typical of tidally influenced systems with significant marsh drainage and were considered natural, not standards violations. In the 1991 sediment sample, PCB-1242 was detected. A significantly decreasing trend in total phosphorus concentration suggest improving conditions. Recreational uses are fully supported.

Another site, located in 03050202-070, represents a significant portion of the waters in this watershed unit. At S.C. Hwy. 700, aquatic life uses are not supported due to high metals concentrations, compounded by dissolved oxygen excursions and significantly decreasing trends in dissolved oxygen concentration and pH. Although low dissolved oxygen and pH are typical of tidally influenced systems with significant marsh drainage, the occurrence of decreasing trends suggests potential developing problems. A high concentration of copper was measured in water in 1989, and a very high concentration of zinc was measured in water in 1992. In sediment, copper was very high in the 1989 sample, and high in the 1993 sample. Significantly decreasing trends in five-day

biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported.

Elliott Cut - Aquatic life uses are fully supported. Although there were dissolved oxygen excursions, these were typical of values seen in tidally influenced systems with significant marsh drainage, and as such were considered to be natural in origin, not standards violations. In addition, this is a secondary monitoring station, and sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. A significantly decreasing trend in pH was also detected. Recreational uses are not supported due to fecal coliform bacteria excursions. Water quality at this site is influenced by water entering from Charleston Harbor on the rising tide.

Wappoo Creek - Aquatic life uses are fully supported, but may be threatened by a significantly declining trend in dissolved oxygen concentration. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported. Water quality at this site is influenced by water entering from Charleston Harbor on the rising tide.

Log Bridge Creek - Aquatic life uses are fully supported. Although there were dissolved oxygen and pH excursions, these were typical of values seen in tidally influenced systems with significant marsh drainage, and were considered to be natural in origin, not standards violations. Recreational uses are not supported due to fecal coliform bacteria excursions.

Shellfish Harvesting Status

Waters prohibited to harvesting include a six mile area surrounding St. Andrews PSD/Savage Road wastewater treatment facility, affecting both this watershed and 03050202-070. This area extends from the abandoned Seaboard Coast Line railroad trestle to 1000 feet south of Stono Marina and incorporates Stono Marina, Buzzards Roost Marina, and Swygert Shipyard wastewater treatment facility. Waters restricted to harvesting include the Stono River and all its tributaries including Elliott Cut and Wappoo Creek. Two permitted wastewater treatment facilities, located along the Stono River, have the potential to impact shellfish harvesting. In addition, waters from Charleston Harbor that are high in fecal coliform enter through Elliott Cut and travel upstream and downstream of the Stono River.

Activities Potentially Affecting Water Quality

Point Source Contributions

Elliott Cut is included on the §303(d) low priority list of waters that may require TMDL development in relation to dissolved oxygen and fecal coliform concerns.

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***LIMITATION (EL/WQL)***
COMMENT	

STONO RIVER SWYGERT SHIPYARD PIPE #: 001 FLOW: 0.0066	SC0037770 MINOR INDUSTRIAL EFFLUENT
STONO RIVER DITCH CHARLESTON CPW/ST.ANDREWS PSD PIPE #: 001 FLOW: 1.50	SC0026051 MAJOR MUNICIPAL EFFLUENT
LOG BRIDGE CREEK GEIGER C & M OIL PIPE #: 001 FLOW: 0.115 WQL FOR TOXICS; WETLAND	PROPOSED MINOR INDUSTRIAL WATER QUALITY

Nonpoint Source Contributions

The Stono River is included on the §304(l) long list of impacted waterbodies due to nontoxic concerns. Elliott Cut is included on the §319 list of waters impacted by urban runoff, and water samples collected by the Department indicate numerous fecal coliform excursions and scattered pH and dissolved oxygen excursions.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
BEES FERRY #1 MUNICIPAL	DWP-124 ACTIVE
BEES FERRY-TEMP ST. ASH STORAGE	DWP-124a ACTIVE
BEES FERRY-ASH ASH/MONO	AMP-002 INACTIVE
ST. ANDREWS MUNICIPAL	—— CLOSED
HOLLYWOOD MUNICIPAL	—— CLOSED
TRIDENT/JOHNS ISLAND MUNICIPAL	DWP-003 CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
RANTOWLES LANDING MINING CO. CHAPLIN LANDING MINE	0613-10 SAND/CLAY
FELDER TRUCK LINES PALMETTO PIT #3	0645-10 SAND/CLAY

ISLAND CONSTRUCTION CO., INC. JACKSONBORO ROAD MINE	0655-10 SAND
BOHICKET CONSTRUCTION CO., INC. HYDE PARK MINE	0694-10 SAND/CLAY
ADDCO MINING COMPANY EVERGREEN MINE	0252-18 SAND/CLAY
G.S. WAY, JR MD WAY MINE	0948-18 SAND/CLAY
BANKS CONSTRUCTION COMPANY WESTVACO MINE	0842-18 SAND
ROYAL LAND, INC. ROYAL LAND #1 MINE	0695-10 SAND/CLAY
RW MCDANIELS CONSTR. & MINING CO. MCDANIEL MINE	0894-10 SAND/CLAY

Growth Potential

The areas with a high potential for growth in the watershed include Stono Ferry in Hollywood; Rushland Plantation, Headquarters Plantation, and Fenwick Acres on Johns Island; and Bees Landing and Essex Farms in the City of Charleston. Water and sewer services are available to all these growth areas.

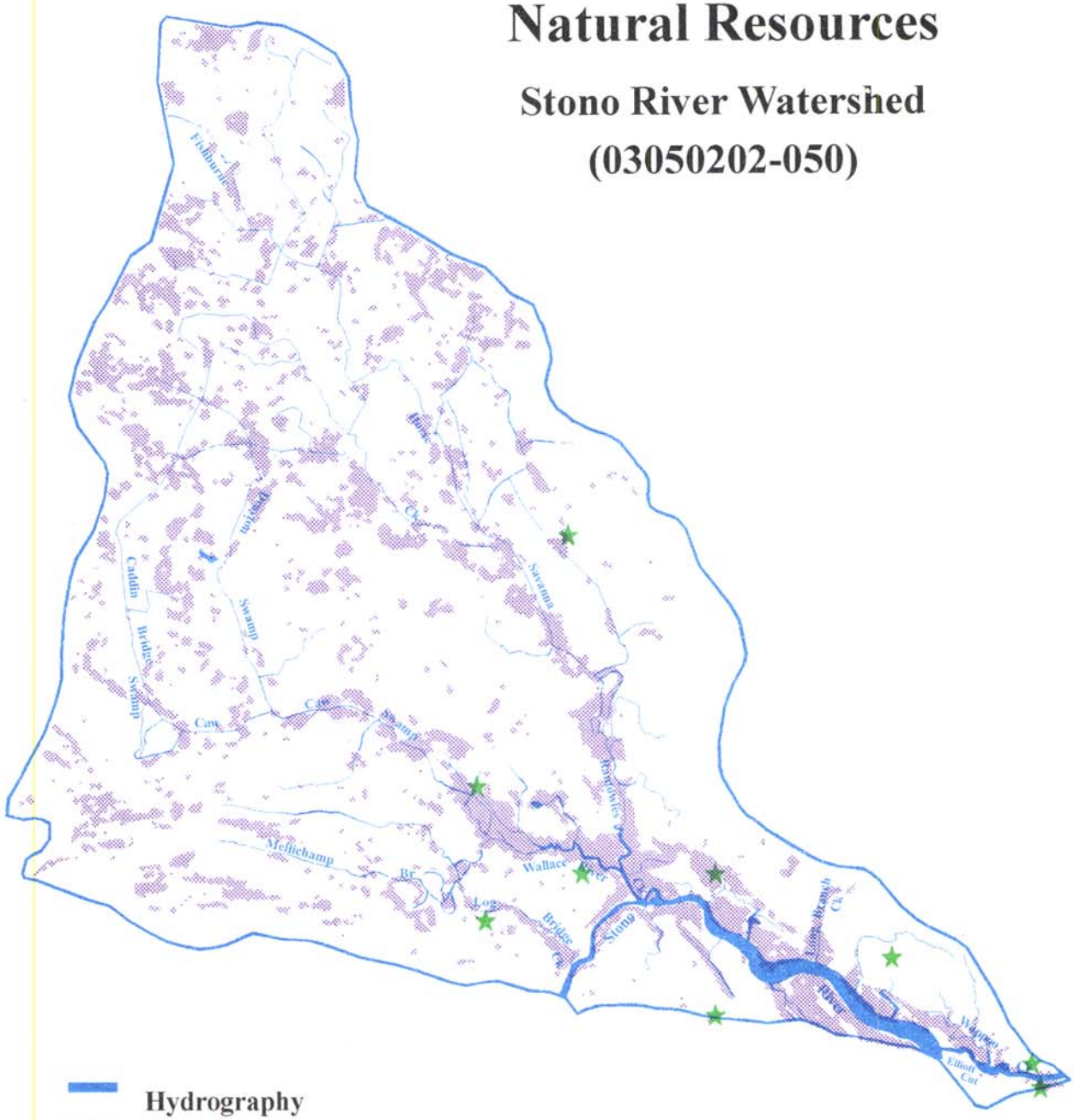
Implementation Strategy

Recreational uses for Elliot Cut and Log Bridge Creek are impaired due to elevated fecal coliform bacteria concentrations from nonpoint sources. Wappoo Creek has a declining trend in dissolved oxygen concentrations due to unknown sources. An evaluation of this situation is ongoing. The Department's Watershed Implementation Staff will determine, where possible, the source of the water quality impairments and recommend solutions to correct the problem.

Natural Resources

Stono River Watershed

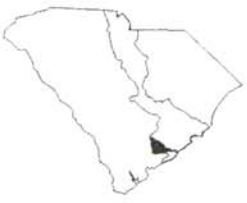
(03050202-050)



Hydrography

Wetlands

Endangered Species



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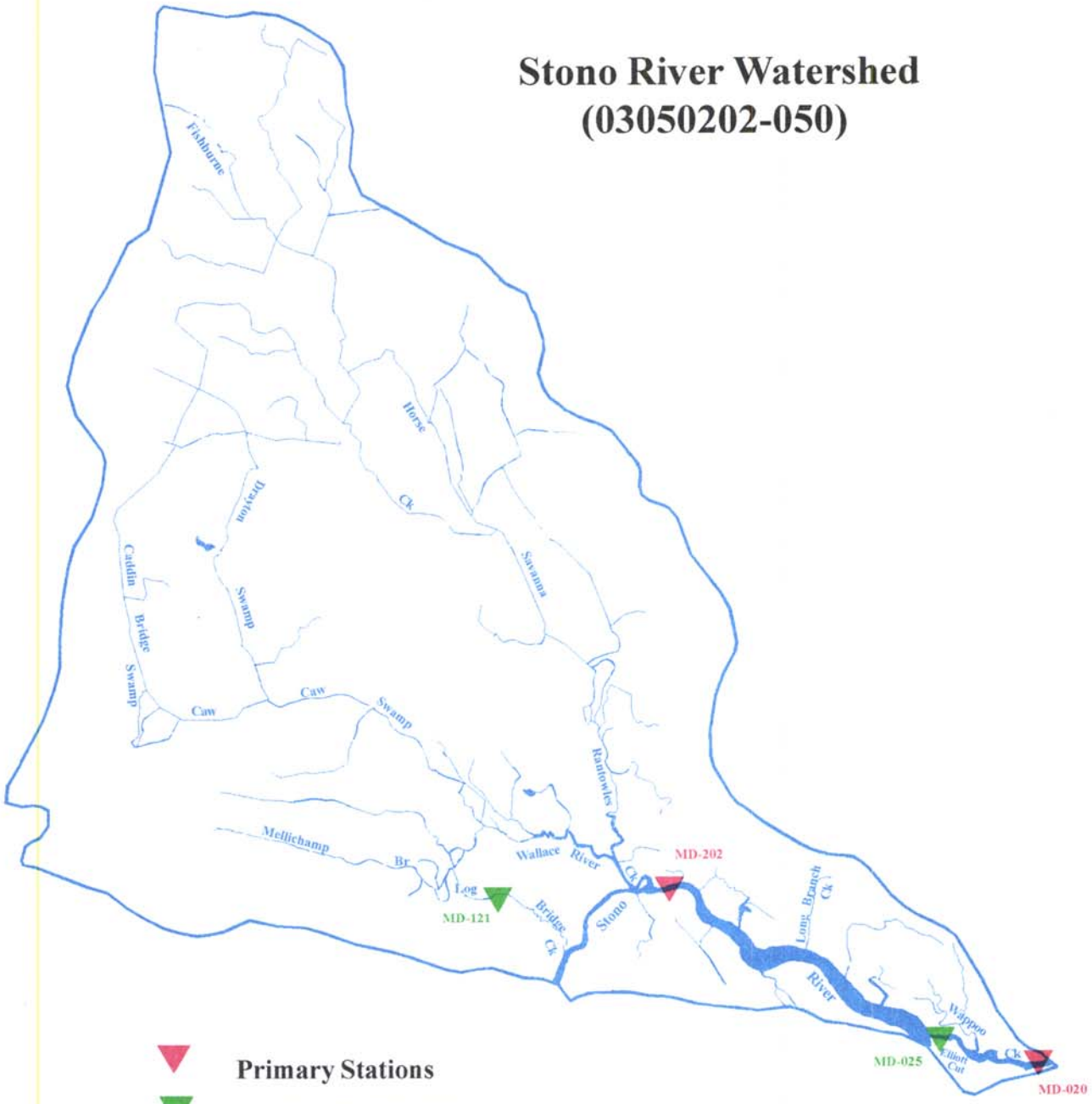
SCDHEC-BQC, 1995

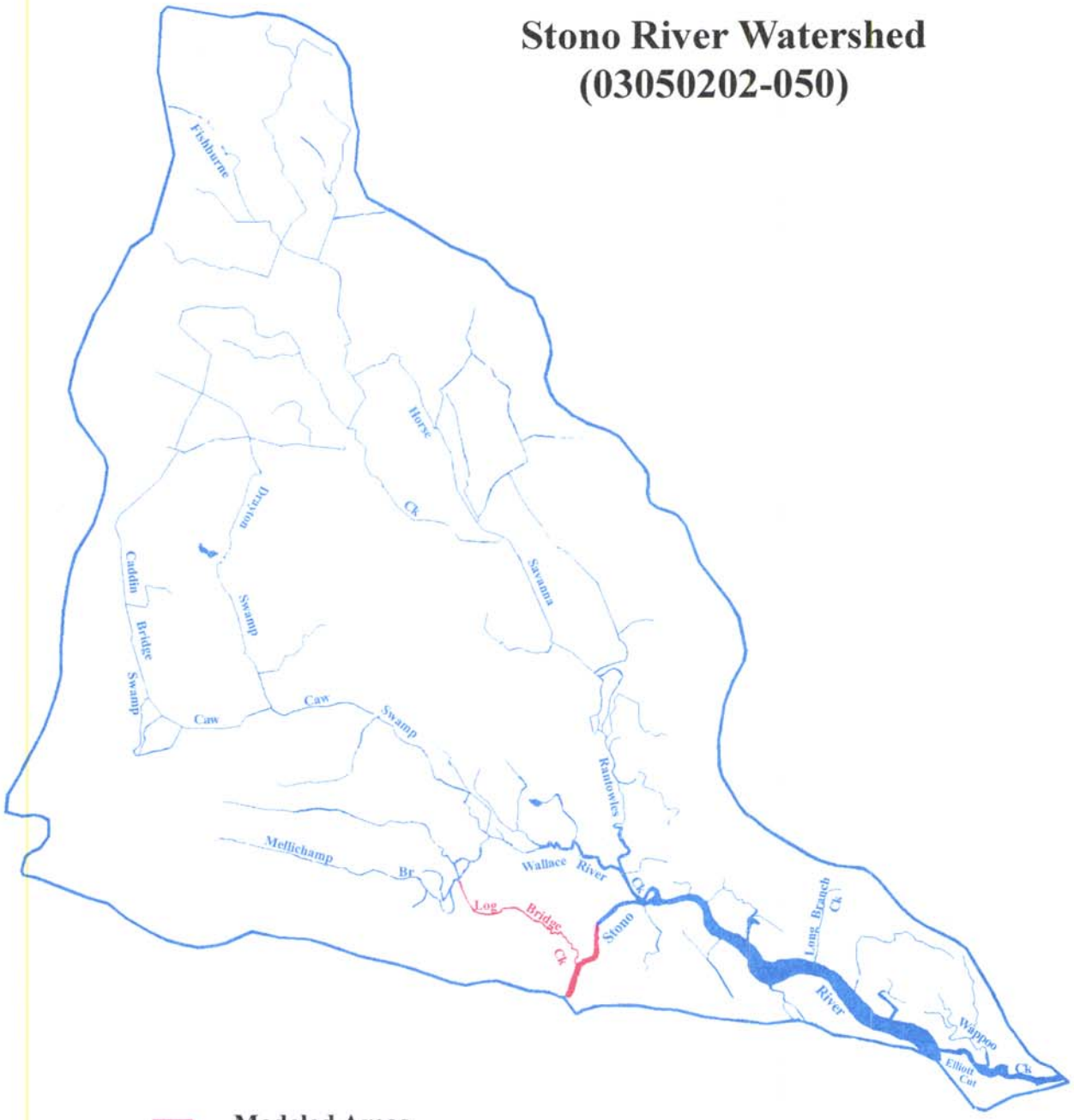
Water Quality Monitoring Stations

Stono River Watershed (03050202-050)



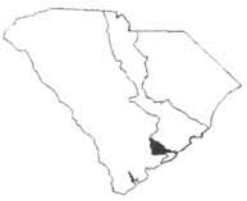
Streams Modeled for Wasteload Allocation

Stono River Watershed (03050202-050)



Modeled Areas

Hydrography

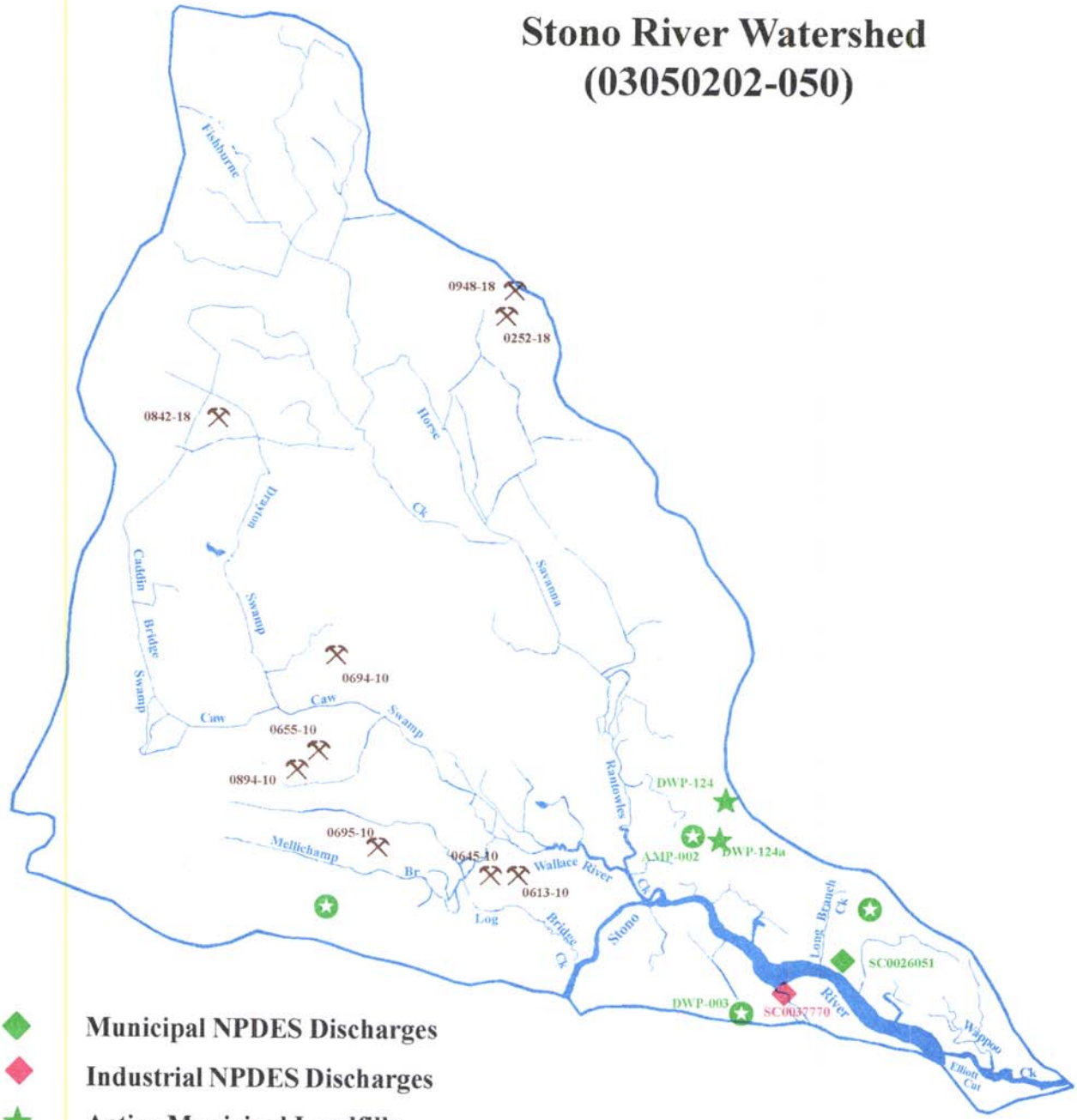


0 1 2 3 4 5 MILES

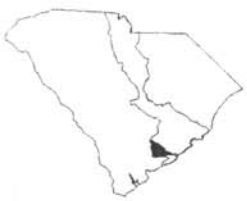
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Stono River Watershed (03050202-050)



- Municipal NPDES Discharges
- Industrial NPDES Discharges
- Active Municipal Landfills
- Closed Municipal Landfills
- Mining Activities
- Hydrography



0 1 2 3 4 5 MILES

SCDHEC-BQC, 1995

03050202-060

(Intracoastal Waterway)

General Description

Watershed 03050202-060 is located in Charleston County and consists primarily of the ***Intracoastal Waterway*** and its tributaries from the Ben Sawyer Bridge to the South Santee River. The watershed occupies 139,962 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Bohicket-Capers-Chipley series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 2.58% urban land, 0.51% agricultural land, 5.93% scrub/shrub land, 0.35% barren land, 29.42% forested land, 6.04% forested wetland, 34.58% nonforested wetland, and 20.60% water.

This watershed consists of the Intracoastal Waterway (ICWW), which flows past numerous sea islands and the tidally influenced creeks that separate them. There are a total of 117.6 square miles of estuarine areas in this watershed, all classified SFH. Inlet Creek, Swinton Creek, and Conch Creek located near Sullivans Island, drain to the Atlantic Ocean via Breach Inlet. Morgan Creek, Seven Reaches, and Cedar Creek flow into Meeting Reach (ICWW). Seven Reaches also drains into Gray Bay as does Hamlin Creek and Long Creek. Hamlin and Long Creeks also flow into Hamlin Sound, which in turn drains into Copahee Sound and Bullyard Sound. Dewees Creek collects drainage from Bullyard Sound and Hamlin Sound, together with Old House Creek and Horsebend Creek, and flows through Dewees Inlet to the Atlantic Ocean.

Capers Creek, Watermelon Creek, Toomer Creek, and Whiteside Creek drain to the ocean through Capers Inlet. The Santee Pass connects Capers Creek to Mark Bay and drains to the ocean via Price Inlet. Other streams draining into Price Inlet include Price Creek, Clauson Creek, and Bull Narrows. Bull Narrows also flows into Sewee Bay and Hickory Bay. Back Creek connects Sewee Bay to Bull Creek (Summerhouse Creek, Jack Creek), which flows into Bull Harbor and Bulls Bay. Other streams draining into Bull Harbor and Bulls Bay include Anderson Creek, Blind Creek, Venning Creek, Belvedere Creek, Vanderhorst Creek, Saltpond Creek, and Graham Creek.

Bell Creek (Cooter Creek, Withey Wood Canal) and Steed Creek join to form Awendaw Creek and Lake Awendaw (125 acres), which flows into the Harbor River (ICWW) and into Bulls Bay. Other streams draining into the Harbor River from the mainland, near the Town of McClellanville, include Sandy Point Creek, Doe Hall Creek, Tibwin Creek, and Long Creek. Bull River (Sett Creek, Little Sett Creek), and Five Fathom Creek (Clark Creek, Key Creek, Key Bay, Santee Path Creek, Papas Creek, Little Papas Creek, Matthews Creek, Town Creek, Clubhouse Creek) drain directing into Bulls Bay. Jeremy Creek flows into the ICWW across the waterway from Five Fathom Creek. Clubhouse Creek connects Five Fathom Creek to Oyster Bay and Muddy Bay (Nellie Creek, Joe and Ben Creek, Shrine Creek, Horsehead Creek).

The Romain River is formed at the confluence of Santee Path Creek and Nellie Creek, and accepts drainage from Key Creek (Bay Creek), Muddy Bay, and Slack Reach (Devils Den Creek,

Horsehead Creek, Mill Den Creek) before flowing into Cape Romain Harbor. Key Creek also drains into the ocean via Raccoon Creek and Key Inlet. Other streams draining in Cape Romain Harbor include Congaree Boat Creek (Joe and Ben Creek), Casino Creek (Mill Creek, Needles Eye Creek), Deepwater Creek, and Alligator Creek (Ramhorn Creek). Additional natural resources in the watershed include the Cape Romain National Wildlife Refuge (55,000 acres) and portions of the Frances Marion National Forest. Due to the absence of point source dischargers and the presence of endangered species, several streams (or portions of streams) may qualify as potential ORW candidates: Steed Creek, Cooter Creek, and the entire area from Dewees Inlet to the South Santee River excluding the intracoastal waterway, Jeremy Creek, Awendaw Creek, and Tibwin Creek.

Water Quality

Intracoastal Waterway - Aquatic life uses are fully supported for this portion of the ICWW, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported.

Awendaw Creek - Aquatic life uses are fully supported. Although dissolved oxygen and pH excursions occurred, they were typical of values seen in tidally influenced systems with significant marsh drainage and were considered natural, not standards violations. Recreational uses are not supported due to fecal coliform bacteria excursions.

Jeremy Creek - Aquatic life uses are fully supported. Although dissolved oxygen excursions occurred, they were typical of values seen in tidally influenced systems with significant marsh drainage and were considered natural, not standards violations. A very high concentration of zinc was measured in the 1991 sediment sample, together with metabolites of DDT and the pesticide malathion. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Santee Coastal Reserve Pond - The pond was treated in 1994 with aquatic herbicides to control aquatic plant growth and reclaim recreational areas for waterfowl management and hunting.

Shellfish Harvesting Status

Waters that are conditionally approved for shellfish harvesting include the upper reaches of Conch Creek, Inlet Creek, and Swinton Creek. Restricted harvesting waters in this area include the bay in upper Inlet Creek, Hamlin Creek (from its confluence with Swinton Creek to the ICWW), the Sullivan Island Narrows (from the Ben Sawyer Bridge to Conch Creek), Conch Creek (from the ICWW to Lofton Creek), and the ICWW (from the Ben Sawyer Bridge to its confluence with Conch Creek, and from Hamlin Creek to the Wild Dunes Golf Club drainage outfall).

Shellfish harvesting areas restricted to harvesting in the upper portion of the watershed include all the waters of the intracoastal waterway (ICWW), the waters of Alligator Creek (from its confluence with the ICWW to its confluence with Ramhorn Creek), the waters of Ramhorn Creek, and the waters of Casino Creek, Shrine Creek, and DuPre Creek extending 1000 feet from their confluence with the ICWW. The primary factor affecting these streams is the introduction of fresh water with sustained elevated fecal coliform levels as a result of the Cooper River Rediversion project. These effects of rediversion resulted in the closure of the Alligator Creek State Shellfish Ground. The waters of Tibwin Creek, Awendaw Creek, and Doehall Creek, from their headwaters to their confluence with the ICWW, are also restricted to harvesting. The headwaters of these creeks originate in the freshwater swamps of the Francis Marion National Forest and serve as direct conduits of low saline waters during rainfall and stormwater runoff events. These areas are additionally impacted by silviculture and construction activities near their shorelines.

Waters prohibited to harvesting include Jeremy Creek and Sandy Point Creek from their headwaters to their confluence with the ICWW. Although Jeremy Creek actually meets Restricted criteria, it is administratively designated Prohibited due to a wastewater treatment discharge and numerous commercial docking facilities, which present the potential for water quality degradation. Sandy Point Creek is designated Prohibited due to elevated fecal coliform levels. Further down in the watershed, the waters of the ICWW and Morgan Creek from 1000 feet south of Forest Trails WWTP discharge to 1000 feet north of Wild Dunes Marina complex are Prohibited to harvesting. Additional prohibited areas include the waters within 1000 feet of Tolers Cove, Breach Inlet, Long Island, and Wild Dunes Marinas, the waters adjacent to Sullivans Island WWTP outfall, and the waters of the ICWW from 25th Street in Isle of Palms north to Gray Bay. Also prohibited are upper Inlet Creek at Jennie Creek, and Hamlin Creek from its confluence with Swinton Creek to Breach Inlet.

Urban stormwater runoff appears to have a significant impact on the lower portion of the watershed. A series of ditches carry stormwater directly into the ICWW, together with spoil containment areas which discharge into the ICWW and its tributaries (Conch Creek, Inlet Creek, and Swinton Creek) during storm events. There are also 88 individual sewage treatment and disposal systems located along these banks, but no malfunctions were noted.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
JEREMY CREEK TRIB LINCOLN HIGH SCHOOL PIPE #: 001 FLOW: 0.016 WQL FOR BOD_5, TRC, NH3-N, DO TO BE ELIMINATED	SC0033618 MINOR COMMUNITY WATER QUALITY

HAMLIN CREEK ISLE OF PALMS WATER CO. PIPE #: 001 FLOW: M/R WQL FOR TRC	SC0043583 MINOR INDUSTRIAL WATER QUALITY
MEETING REACH ISLE OF PALMS/FOREST TRAILS PLT PIPE #: 001 FLOW: 0.30 WQL FOR FECAL	SC0025283 MINOR MUNICIPAL WATER QUALITY
OLD HOUSE CREEK DEWEES ISLAND WWTP PIPE #: 001 FLOW: 0.025 UNCONSTRUCTED; WETLAND	SC0046817 MINOR INDUSTRIAL EFFLUENT
LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
TILE FIELD DEWEES ISLAND	ND0069329 MINOR COMMUNITY
SPRAY ON GOLF COURSE ISLE OF PALMS/WILD DUNES	ND0062260 MINOR MUNICIPAL
SPRAYFIELD LINCOLN HIGH SCHOOL	ND0073016 (PROPOSED) MINOR COMMUNITY

Nonpoint Source Contributions

The entire coastal watershed is included on the §303(d) low priority list of waters that may require TMDL development in relation to nonpoint source concerns. In addition, Sandy Point Creek and the intracoastal waterway are included on the §303(d) low priority list for fecal coliform concerns. Cooter Creek is included on the §319 list of waters impacted by unknown nonpoint sources. Water samples collected by the Department indicate elevated ammonia levels and excursions of dissolved oxygen and pH on numerous occasions, and scattered elevated levels of toxic materials. Cooter Creek is also included on the §304(l) long list of waters impacted by nontoxic pollutants.

East Cooper Watershed Project

This is a comprehensive NPS watershed management project initiated in FY-1991. The project area consists of lands adjoining the Intracoastal Waterway and its tributaries from the Charleston Harbor to Dewees Inlet and northward to McClellanville. Included are the jurisdictions of Charleston County, Mt. Pleasant, Sullivans Island, and Isle of Palms. The goal of the project is to implement a comprehensive approach to prevent and control water resource impacts from nonpoint source pollution within the project area. If this goal is accomplished, existing water uses (shellfish culture and harvesting, recreation, etc.) will be maintained and enhanced. Components of the project include source identification through monitoring, developing solutions (best management practices), education, public participation, implementing solutions, and evaluation monitoring. The SCDHEC is the project manager with participation from the SCDNR and Clemson University.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
ISLE OF PALMS MUNICIPAL	—— CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
ISLAND CONSTRUCTION CO.,INC. MOUNT PLEASANT PIT	0183-10 SAND/CLAY
ADCO MINING COMPANY SHELL POINT MINE	0236-10 SAND/CLAY
ISLAND DIRT, INC. SHEPPARD PIT #1	0652-10 SAND/CLAY
ISLAND DIRT, INC. OAKLAND MINE	0657-10 SAND/CLAY
LOWCOUNTRY DIRT, INC. SCHAFFER MINE	1004-10 SAND/TOPSOIL
LOWCOUNTRY DIRT, INC. BATTERY ISLAND MINE	1005-10 SAND

Growth Potential

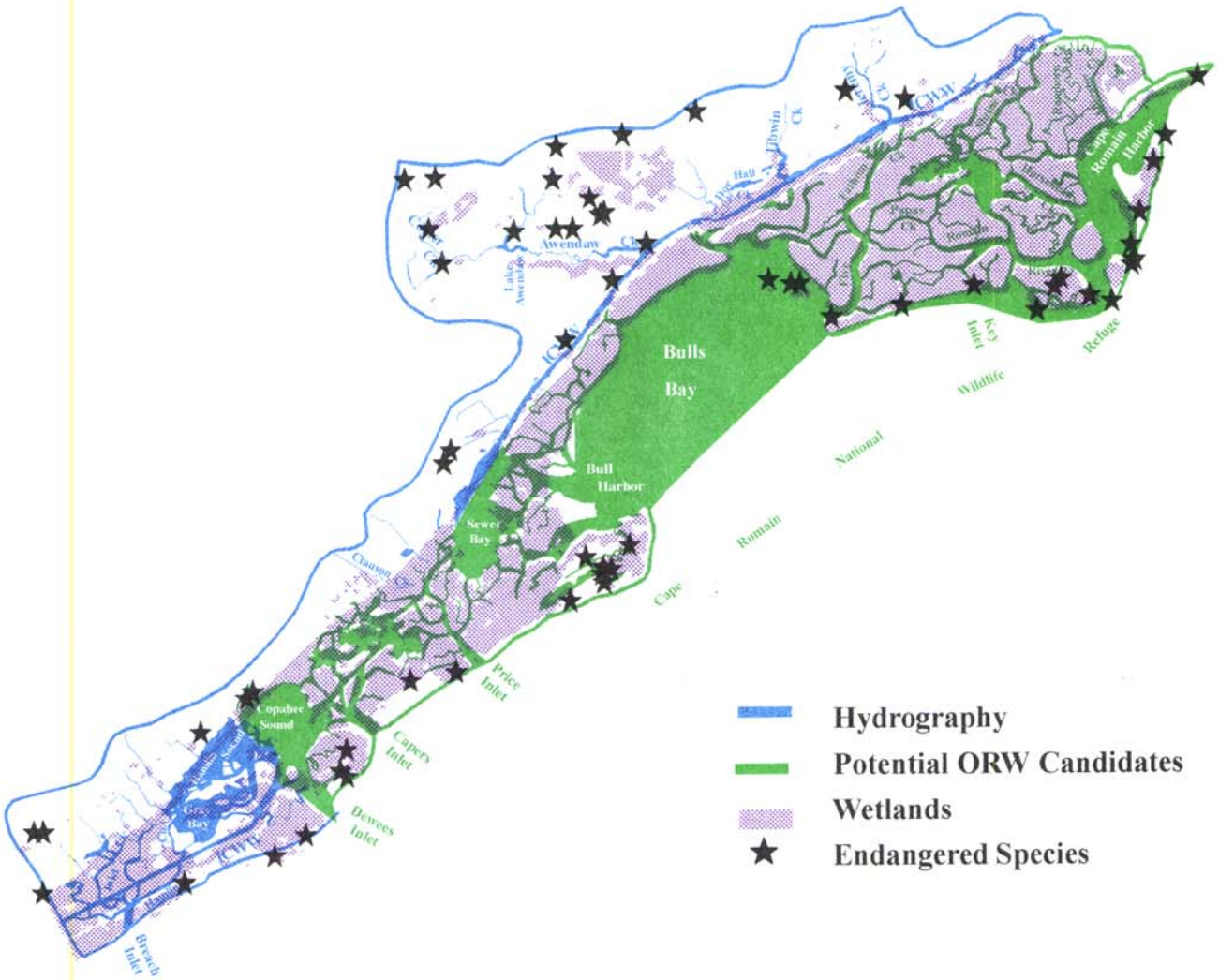
There is a high potential for growth in this watershed. Several suburban growth areas surround the City of Charleston. Some of the larger planned developments include Wild Dunes, Shell Point, Hidden Lakes, Seaside Farms, Palmetto Fort, and the Charleston National Country Club. All growth areas in the watershed have water and sewer services available. Sources of tourism in this watershed include Patriots Point and Fort Moultrie. Although the McClellanville area experiences scattered low density development, significant growth is not anticipated.

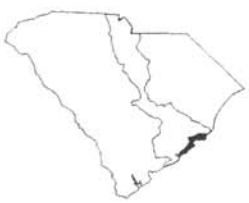
Implementation Strategy

Recreational uses for Awendaw Creek and Jeremy Creek are impaired due to elevated fecal coliform bacteria concentrations from nonpoint sources, most notably septic tank failure and shrimp boat dockage. The ICWW has an increasing trend in turbidity and a declining trend in dissolved oxygen concentrations due to unknown sources. An evaluation of these situations is ongoing. The Department's Watershed Implementation Staff will determine, where possible, the source of the water quality impairments and recommend solutions to correct the problem.

Natural Resources

Intracoastal Waterway Watershed
(03050202-060)





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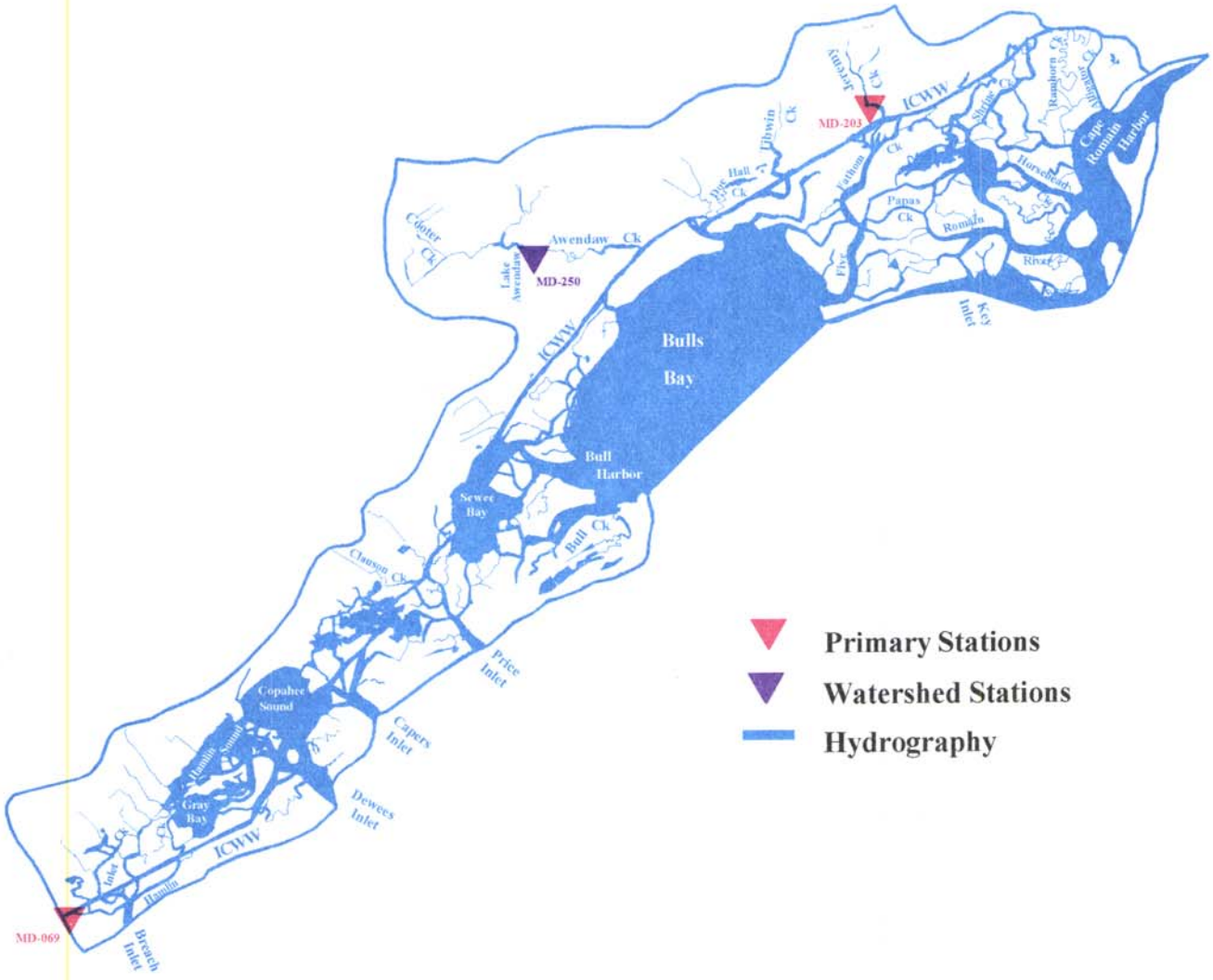
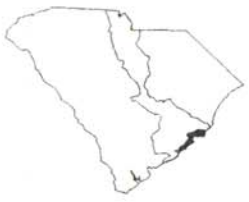
SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Intracoastal Waterway Watershed
(03050202-060)





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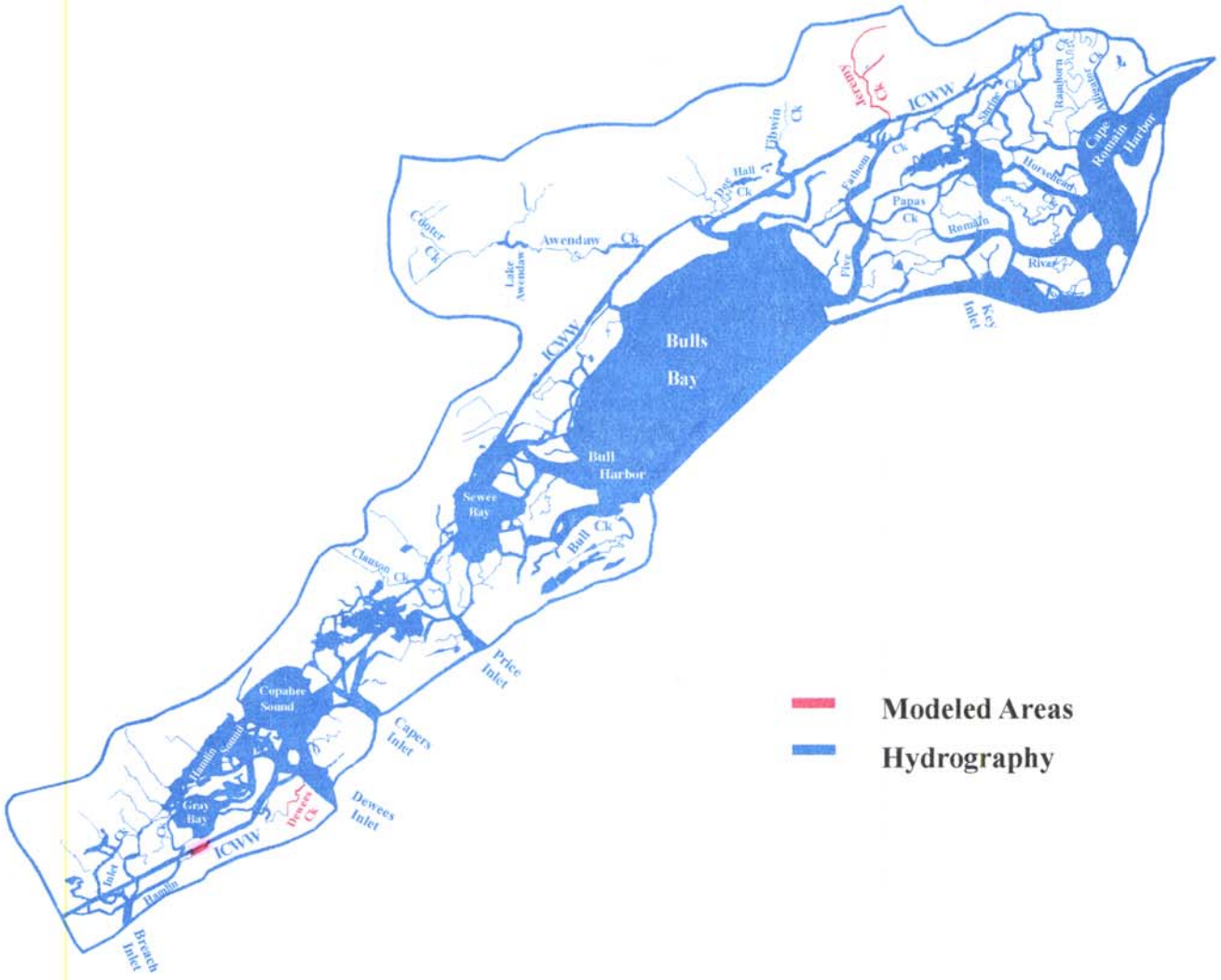
SCDHEC-EQC, 1995

Streams Modeled for Wasteload Allocation

Intracoastal Waterway Watershed
(03050202-060)



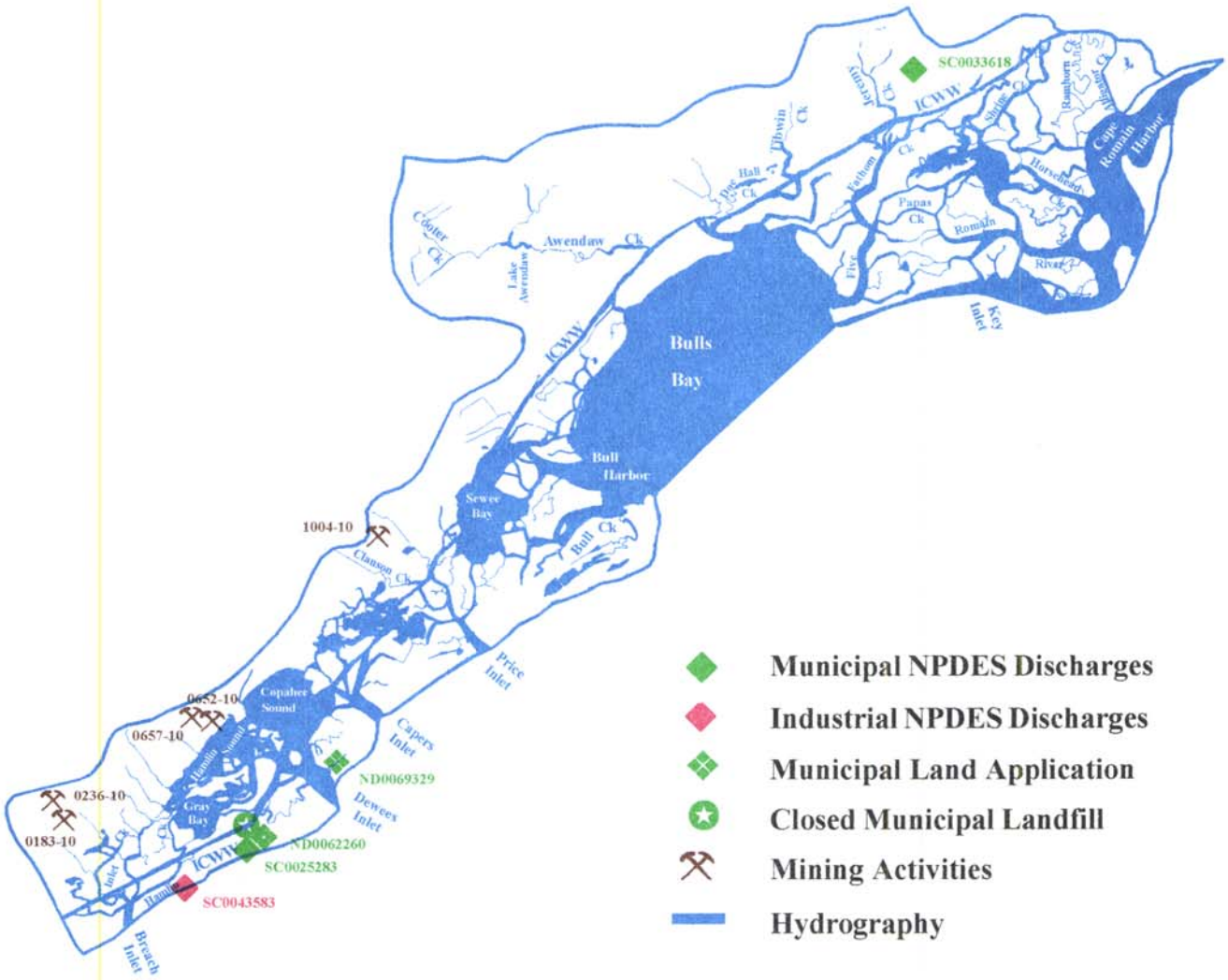
0 1 2 3 4 5 MILES

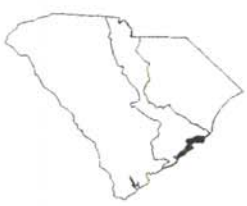
SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Intracoastal Waterway Watershed

(03050202-060)





SCDHEC-EQC, 1995

03050202-070

(Charleston Harbor/Stono River)

General Description

Watershed 03050202-070 is located in Charleston County and consists primarily of the ***Charleston Harbor*** and its tributaries, and the ***Stono River*** with its tributaries from Wappoo Creek to the Atlantic Ocean. The watershed occupies 74,137 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Bohicket-Capers-Kiawah-Foxworth series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 1%, with a range of 0-6%. Land use/land cover in the watershed includes: 7.74% urban land, 3.63% agricultural land, 9.93% scrub/shrub land, 0.30% barren land, 31.76% forested land, 1.21% forested wetland, 27.73% nonforested wetland, and 17.70% water.

This segment of the Stono River accepts drainage from the upper Stono River watershed (03050202-050), flows between Johns Island and James Island, and then flows through the Stono Inlet to the Atlantic Ocean. On the Johns Island side of the river, the Stono River receives drainage from Pennys Creek, Hut Creek, Abbapoola Creek, Alligator Creek, and the Kiawah River. The Kiawah River accepts drainage from Captain Sams Creek, Haulover Creek, Bryans Creek, and Chaplin Creek. The Kiawah River drains directly into the Atlantic Ocean through Captain Sams Inlet. Bass Creek (Cinder Creek) drains into the Stono River from Kiawah Island.

Streams draining into the Stono River from James Island include James Island Creek or Ellis Creek (Simpson Creek, Wolfpit Run), Holland Island Creek, and Green Creek. The Folly River (Folly Creek, Oak Island Creek, Robbins Creek, King Flats Creek, Cutoff Reach, Cole Creek) drains into the Stono River at the mouth of the Stono River. Robbins Creek and King Flats Creek are also connected to the Stono River through Green Creek. Lighthouse Creek (Block Island Creek, Rat Island Creek, Ft. Johnson Creek, First Sister Creek, Second Sister Creek) flows between Folly Island and Morris Island and through Lighthouse Inlet to the ocean. Ft. Johnson Creek connects the Lighthouse Creek drainage to Clark Sound (Seaside Creek, Secessionville Creek). The sound drains into Charleston Harbor through Schooner Creek near Fort Sumter. Also draining in the Charleston Harbor is Dill Creek, the Ashley River watershed (02050202-040), the Cooper River watershed (03050201-050), Horse Creek, Shem Creek, The Cove (Cove Creek), Bass Creek, and Parrot Point Creek. There are a total of 66.2 square miles of estuarine areas in this watershed, all classified SFH.

Water Quality

Charleston Harbor - The Charleston Harbor is located at the confluence of the Ashley (03050202-040), Cooper (03050201-050), and Wando (03050201-080) Rivers. The surface area of the harbor is 65 km^2 with an additional 104 km^2 of marsh and lowlands. The harbor drains an area of 42,000 km^2, and has a mean tidal range of 1.6m with an average depth of low water of 3.7m (Van Dolah, et. al 1990). The Ashley and Wando Rivers exhibit little freshwater input; however, the Cooper River is

fed by freshwater from Lake Moultrie through the Pinopolis Dam with average daily flows ranging from 0.0 cfs to 20,240 cfs (Santee Cooper 1994).

There are four SCDHEC monitoring sites in the Charleston Harbor. Aquatic life uses are fully supported at the river mouth to the harbor, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Recreational uses are fully supported at the remaining sites. In the vicinity of the Mount Pleasant wastewater treatment plant diffuser discharge, aquatic life uses are fully supported. A significantly increasing trend in pH was detected. At the Fort Johnson pier, aquatic life uses are also fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. In the south channel at bell buoy 28, aquatic life uses are again fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and significantly increasing trends in pH and turbidity. A high concentration of zinc was measured in water in 1992. A high concentration of nickel was measured in the 1990 sediment sample. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, total nitrogen, and fecal coliform bacteria concentrations suggest improving conditions.

Shem Creek - Aquatic life uses are only partially supported due to dissolved oxygen excursions, compounded by a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

The Cove - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration. An elevated concentration of cadmium was measured in 1990. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported.

Intracoastal Waterway - Aquatic life uses are fully supported for this portion of the ICWW (located in 03050202-060, but affecting this watershed as well), but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Recreational uses are fully supported.

Kiawah River - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration. Although there were dissolved oxygen excursions, these were typical of values seen in tidally influenced systems with significant marsh drainage and were considered natural, not standards violations. In addition, this is a secondary

monitoring station, and sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. A significantly decreasing trend in total phosphorus concentration suggests improving conditions. Recreational uses are fully supported.

Stono River - There are three SCDHEC monitoring sites along this section of the Stono River. Recreational uses are fully supported at all three sites. Aquatic life uses are not supported at the upstream site due to high metals concentration, compounded by dissolved oxygen excursions and significantly decreasing trends in dissolved oxygen concentration and pH. Water quality at this site is influenced by water entering from Charleston Harbor on the rising tide. Although low dissolved oxygen and pH are typical of tidally influenced systems with significant marsh drainage, the occurrence of decreasing trends suggests potential developing problems. A high concentration of copper was measured in water in 1989, and a very high concentration of zinc was measured in water in 1992. Copper concentration was very high in the 1989 sediment sample and high in the 1993 sample. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus, and total nitrogen concentrations suggest improving conditions.

Aquatic life uses are fully supported at the midstream site, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration. Although there were dissolved oxygen excursions, these were typical of values seen in tidally influenced systems with significant marsh drainage and were considered natural, not standards violations. In addition, this is a secondary monitoring station, and sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. A significantly decreasing trend in total phosphorus concentration suggests improving conditions.

At the downstream site, aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration. A very high concentration of zinc was measured in water in 1993. A significantly decreasing trend in total phosphorus concentration suggests improving conditions.

Shellfish Harvesting Status

Waters prohibited to shellfish harvesting in this watershed include a 1000 foot area surrounding both Mariners Cay and Folly Marina on the Folly River, a 350 foot area surrounding Crosbys Seafood commercial dock on Folly Creek, and a 1000 foot area surrounding both Backman Seafood commercial dock and Bowens Island Marine Railway on Folly Creek. The entire Charleston Harbor, with the exception of an area northeast of Fort Johnson, is prohibited to harvesting. Two domestic wastewater discharges at Fort Johnson were eliminated, thus changing the area to the northeast from prohibited to conditionally restricted. The Prohibited status is a result of two wastewater treatment plants that discharge to the harbor, numerous marinas, commercial fishing docks, and industrial discharges. The waters from the confluence of Charleston Harbor and the ICWW north to Ben Sawyer Bridge including The Cove and all its tributaries are also prohibited. Other waters prohibited to harvesting include a six mile area surrounding St. Andrews PSD/Savage Road wastewater treatment facility, affecting both this watershed and 03050202-050. This area

extends from the abandoned Seaboard Coast Line railroad trestle to 1000 feet south of Stono Marina and incorporates Stono Marina, Buzzards Roost Marina, and Swygert Shipyard wastewater treatment facility. Waters restricted to harvesting include the Stono River and all its tributaries including Abbapoola Creek. Other restricted waters include Bass Creek from its headwaters to its confluence with Cinder Creek, and Captain Sams Creek from its headwaters to its confluence with the Kiawah River. The remaining streams are approved to harvesting.

Several factors impact shellfish harvesting in this watershed. Nonpoint source runoff from stormwater retention systems at the Kiawah and Seabrook Island resort areas impacts Captain Sams Creek. Two permitted wastewater treatment facilities located upstream in the Stono River (03050201-050) have the potential to impact shellfish harvesting. Waters from Charleston Harbor, high in fecal coliform, enter through Elliott Cut (watershed 03050202-050) and travel upstream and downstream of the Stono River. High saline waters at the mouth of the Stono River minimize the impact.

Activities Potentially Affecting Water Quality

Point Source Contributions

The Stono River is included on the §303(d) high priority list of waters targeted for TMDL development in relation to dissolved oxygen and fecal coliform concerns. The intracoastal waterway, Shem Creek, and Captain Sams Creek are included on the §303(d) low priority list for fecal coliform concerns and the Kiawah River is included for dissolved oxygen concerns.

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION (EL/WQL)*
CHARLESTON HARBOR MT PLEASANT WATER PLANT #1 PIPE #: 001 FLOW: M/R WQL FOR TRC	SC0043265 MINOR INDUSTRIAL WATER QUALITY
CHARLESTON HARBOR MT PLEASANT WATER PLANT #2 PIPE #: 001 FLOW: M/R WQL FOR TRC	SC0043273 MINOR INDUSTRIAL WATER QUALITY
CHARLESTON HARBOR MT PLEASANT WATER PLANT #3 PIPE #: 001 FLOW: M/R WQL FOR TRC	SC0043869 MINOR INDUSTRIAL WATER QUALITY
CHARLESTON HARBOR MT PLEASANT W&SC/CENTER ST. PIPE #: 001 FLOW: 6.7 PIPE #: 002,003 FLOW: M/R	SC0040771 MAJOR MUNICIPAL EFFLUENT
CHARLESTON HARBOR FORT SUMTER NATL. MONUMENT PIPE #: 001 FLOW: M/R PROPOSED	SC0047147 MINOR INDUSTRIAL EFFLUENT

COVE CREEK TOWN OF SULLIVANS ISLAND PIPE #: 001 FLOW: 0.57	SC0020052 MINOR MUNICIPAL EFFLUENT
JAMES ISLAND CREEK EMRO MKTG/PORT OIL #215 PIPE #: 001 FLOW: 0.014 WQL FOR TOXICS; UNCONSTRUCTED	SC0042404 MINOR INDUSTRIAL WATER QUALITY
FOLLY CREEK TRIB ATLANTIC LITTLENECK CLAM FARM PIPE #: 001,002,003 FLOW: M/R WQL FOR BOD_5, NH3-N, DO, FC	SC0044709 MAJOR INDUSTRIAL WATER QUALITY
FOLLY CREEK TRIB ATLANTIC LITTLENECK CLAM FARM PIPE #: 001 FLOW: M/R WQL FOR BOD_5, NH3-N, DO, FECAL UNCONSTRUCTED	SC0046477 MINOR INDUSTRIAL WATER QUALITY
LAND APPLICATION SYSTEM ***FACILITY NAME***	***ND#*** ***TYPE***
SPRAY ON GOLF COURSE KIAWAH ISLAND	ND0017361 MINOR COMMUNITY
SPRAY ON GOLF COURSE SEABROOK ISLAND/HEATER OF SEABROOK	ND0063347 MINOR COMMUNITY

Nonpoint Source Contributions

Charleston Harbor (near Fort Johnson), James Island Creek, the Stono River, and Shem Creek are all included on the §319 list of waters impacted by urban runoff. Information received from Department District engineers, outside agencies, the National Estuarine Inventory, and water samples collected from the harbor by the Department indicate scattered elevated levels of turbidity and toxic materials (zinc,nickel), and excursions of dissolved oxygen and pH. Department water samples from Shem Creek indicate numerous excursions of fecal coliform and dissolved oxygen, together with elevated turbidity levels. James Island Creek water samples indicate scattered dissolved oxygen excursions. Shem Creek and James Island Creek are also included on the §304(l) long list of waters impacted by nontoxic pollutants.

The Stono River is impacted by agricultural activities, construction, and urban runoff. Information from Department District engineers, outside agencies, and water samples collected by the Department indicate numerous dissolved oxygen excursions and scattered elevated levels of toxic materials (copper, zinc). Computer modeling indicates a high potential for NPS problems from agricultural activities for this portion of the Stono River. The Stono River is also included on the §304(l) long list. Clark Sound and Bass Creek are included on the §303(d) low priority list of waters that may require TMDL development, and on the §319 list of waters targeted for implementation action in relation to nonpoint source pollution concerns.

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
TOWN OF SULLIVANS ISLAND MUNICIPAL	—— CLOSED
JAMES ISLAND MUNICIPAL	—— CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CHARLESTON COUNTY KINSEY-BLAKE BORROW PIT	0314-10 SAND/CLAY
DIRTCO MURRAY WOODS PIT	0512-10 SAND/CLAY
ISLAND CONSTRUCTION CO.,INC. TREMONT MINE	0660-10 SAND
LOWCOUNTRY DIRT, INC. BATTERY ISLAND MINE	1005-10 SAND
TRULUCK CONSTRUCTION CO. EXCHANGE LANDING MINE	0687-10 SAND
THREE OAKS LANDSCAPE NURSERY, INC. BURNIN ACRES MINE	0788-10 SAND

Ground Water Concerns

The ground water in the vicinity of the underground storage tank owned by Port Oil #215 is contaminated with petroleum products. The facility is in the remediation phase, and the surface water affected by the contamination is James Island Creek.

Growth Potential

There is a high potential for growth in this watershed. Suburban growth areas include: the Dills Property, Ellis Property II, Stiles Point Plantation, Stonefield, Fort Lamar, Grimbel Shores, and Harborwoods III on James Island; and Kiawah Island, Andell Property, and Hope Plantation on Johns Island. All growth areas in the watershed have water and sewer services available. Sources of tourism in this watershed include Fort Sumter in the Charleston Harbor.

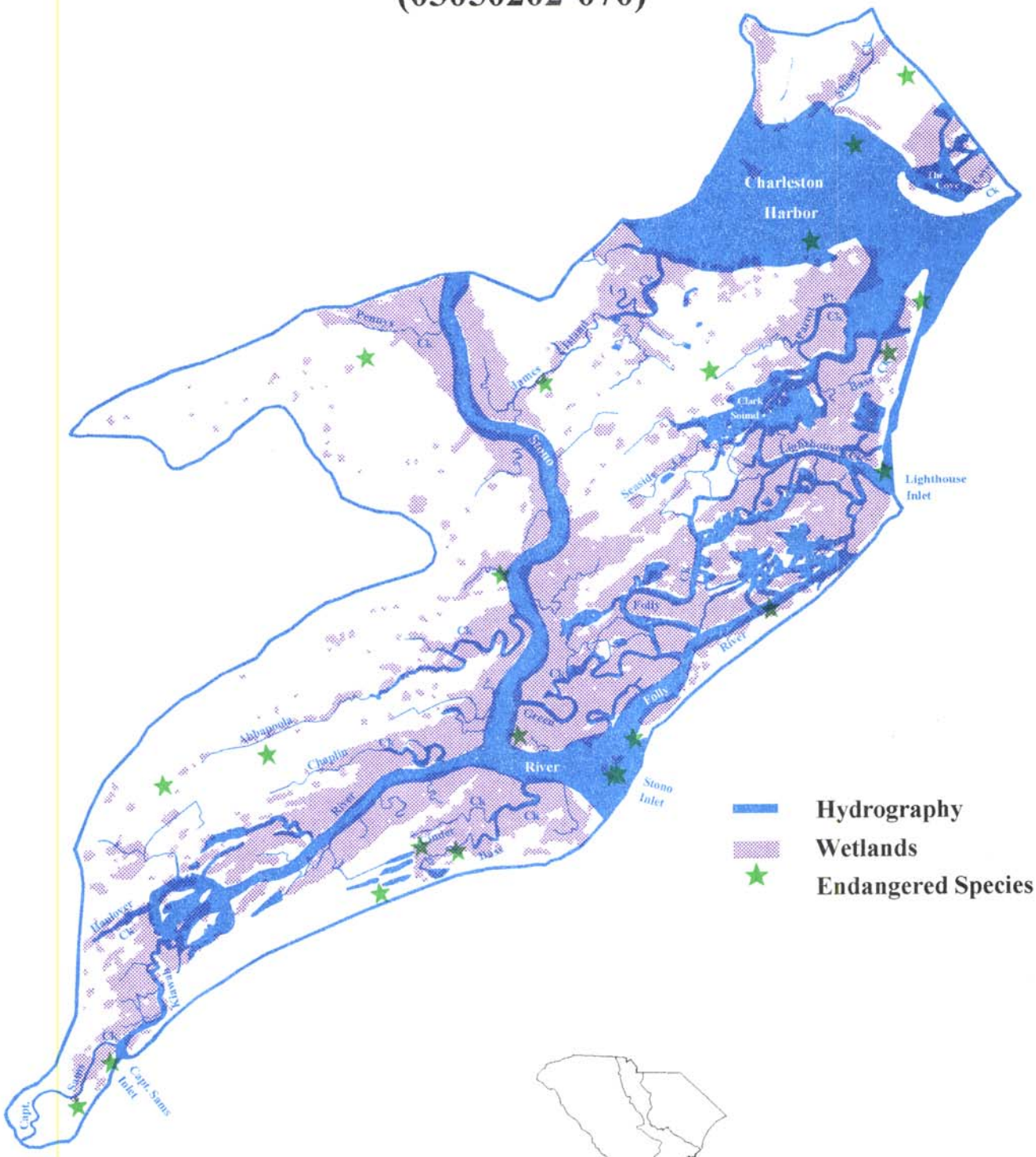
Implementation Strategy

Aquatic life uses for both the Stono River and Shem Creek are impaired due to low dissolved oxygen concentrations. Recreational uses for the Charleston Harbor and Shem Creek are impaired

due to elevated fecal coliform bacteria concentrations. Both impaired uses are due to nonpoint sources, most notably septic tank failure and shrimp boat dockage. The Department's Watershed Implementation Staff will determine, where possible, the source of the water quality impairments and recommend solutions to correct the problem. James Island Creek is impaired due to the introduction of ground water contaminated with organics. The facility involved is currently in the remediation phase. The Charleston Harbor has increasing trends in turbidity and pH, and a declining trend in dissolved oxygen concentrations due to unknown sources. The Cove and the Kiawah River also have a declining trend in dissolved oxygen. An evaluation of these situations is ongoing.

Natural Resources

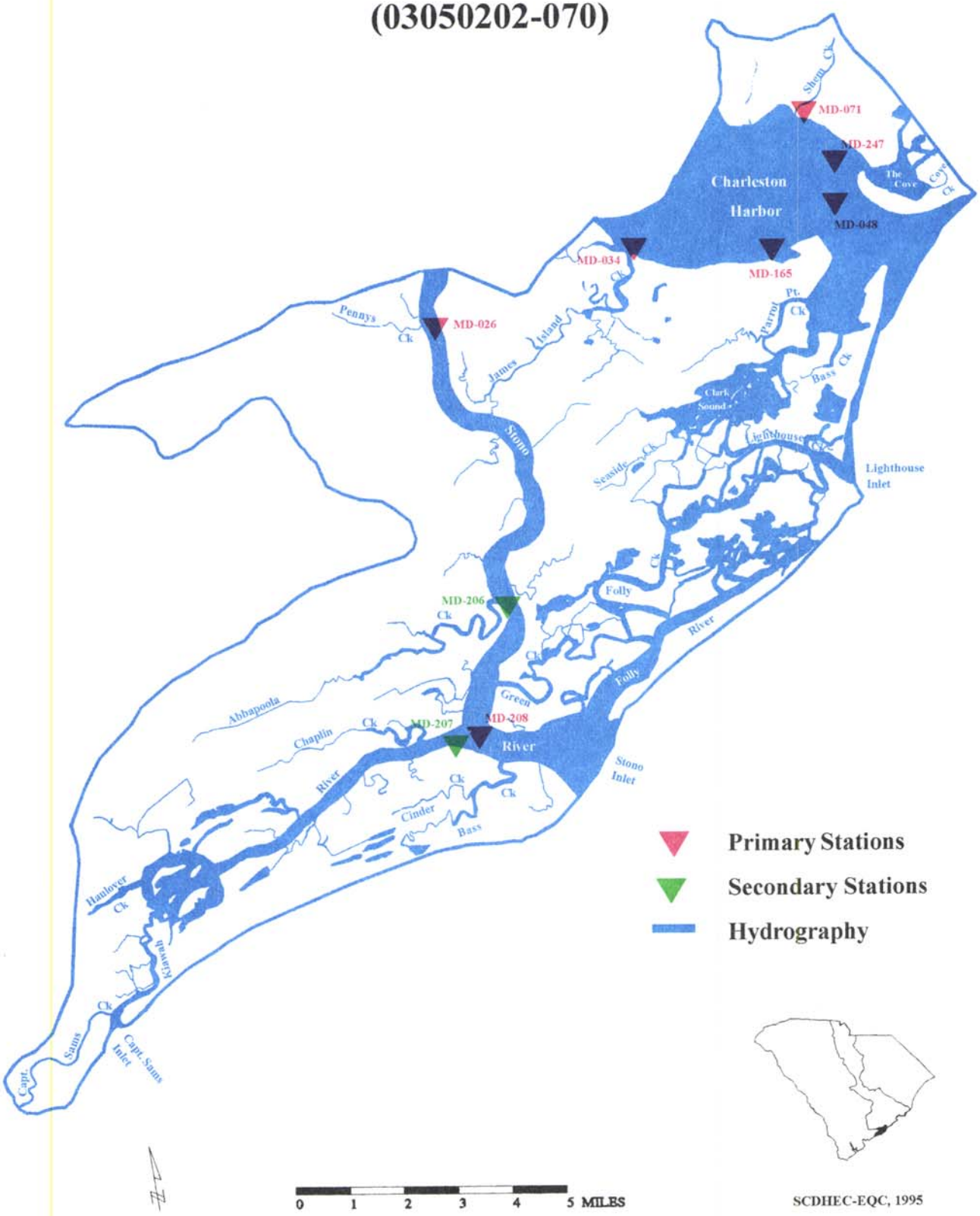
Stono River/Charleston Harbor Watershed (03050202-070)



SCDHEC-EQC, 1995

Water Quality Monitoring Stations

Stono River/Charleston Harbor Watershed (03050202-070)



Streams Modeled for Wasteload Allocation

Stono River/Charleston Harbor Watershed

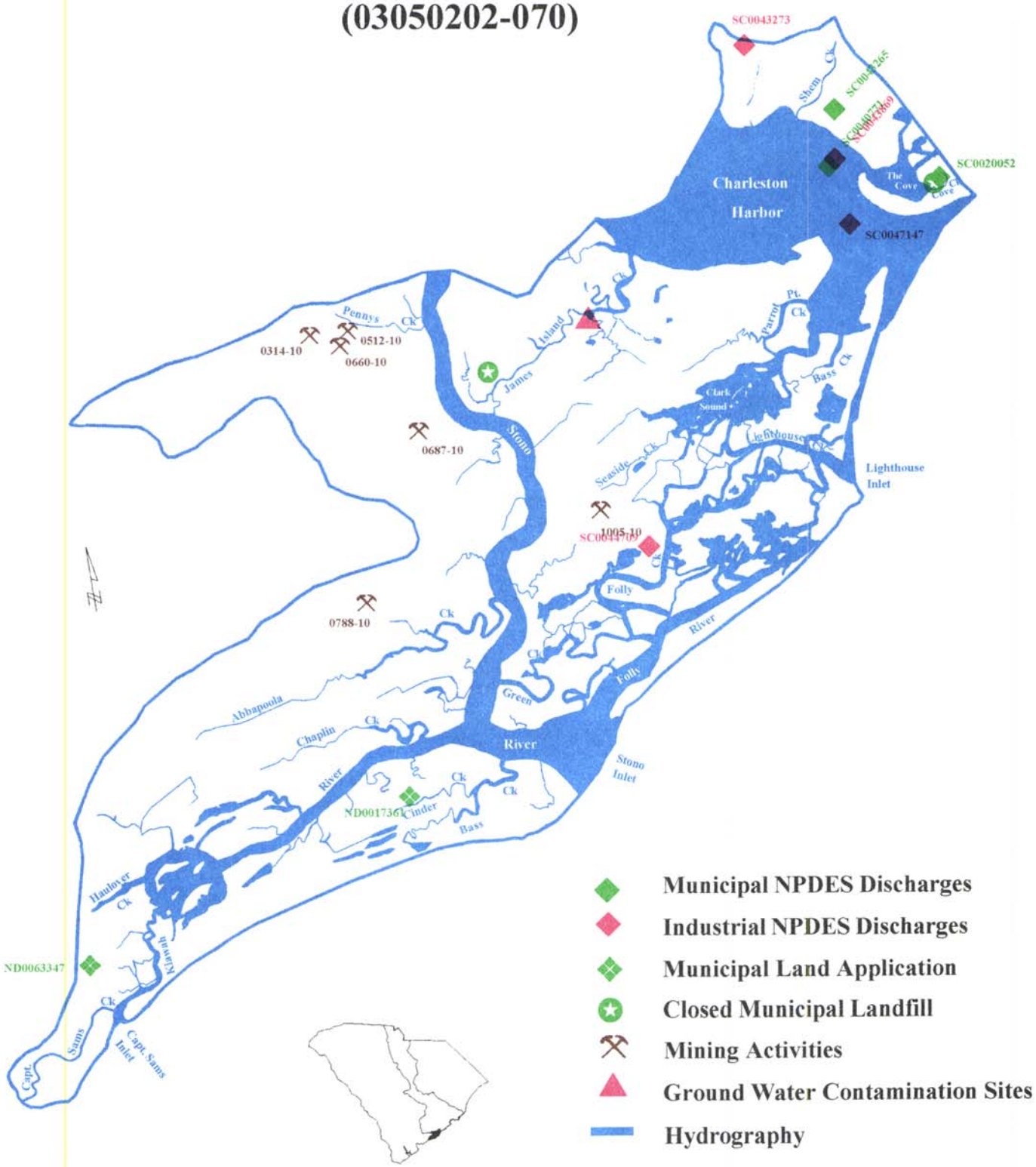
(03050202-070)

SCDHEC-EQC, 1995

Activities Potentially Affecting Water Quality

Stono River/Charleston Harbor Watershed

(03050202-070)



SCDHEC-EQC, 1995

Summary of Water Quality and Implementation Strategies

This summary details both impaired and unimpaired waters. Waters are considered impaired if they are unable to meet classified uses for aquatic life, recreation or fish consumption based on the corresponding standards (see Methodology section for interpretation). Noteworthy long-term trends are identified for unimpaired waters. The actions indicated should occur prior to updating this assessment in 1999. (* See text for additional information.)

IMPAIRED STREAMS

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
03050101-190 Lake Wylie* (6 Sites)	Aquatic Life	NS-Copper, Zinc, Dissolved Oxygen (Mill Ck Arm)	Multiple Factors	N.C.-S.C. Statement to Reduce Discharges
Crowders Creek* (3 Sites)	Aquatic Life	NS,PS-Zinc (2 Midstream Sites)	Multiple Factors	N.C.-S.C. Statement to Reduce Discharges
	Recreation	NS-Fecal Coliform (All Sites)	N.C. Point & Nonpoint Sources	On NPS High Priority List - Recommend Cooperative Study between N.C. & S.C.
South Fork Crowders Creek	Recreation	NS- Fecal Coliform	Nonpoint Source	Further Evaluation
Brown Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Beaverdam Creek	Recreation	NS-Fecal Coliform	Point Source	Revise Permit Limits
			Nonpoint Source	Further Evaluation
03050101-200 Allison Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Calabash Creek*	Recreation	NS-Fecal Coliform	Point Source	Revise Permit Limits
03050103-010 Catawba River* (5 Sites)	Aquatic Life	PS-Dissolved Oxygen (Sites below Lake Wylie & Great Falls Res. Dams)	Impoundment Discharge	The Affects of the Low Dissolved Oxygen Continue to be Studied
Catawba River Trib	Aquatic Life	NS- Zinc & Copper	Unknown	Continue Evaluation
	Recreation	NS-Fecal Coliform	Point Source	Further Evaluation

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
03050103-028 Sugar Creek* (4 Sites)	Aquatic Life	NS-Impacted Macroinvertebrate Community, Zinc (Midstream Site)	N.C. Point & Nonpoint Sources	City of Charlotte (CMUD) Currently Upgrading WWTP to Give Improved Treatment Under Low Flow Conditions
	Recreation	NS-Fecal Coliform (All Sites)	N.C. Point & Nonpoint Sources	City of Charlotte (CMUD) Currently Upgrading WWTP to Give Improved Treatment Under Low Flow Conditions
McAlpine Creek* (2 Sites)	Aquatic Life	NS - Impacted Macroinvertebrate Community, Cr (Downstream Site)	N.C. Point & Nonpoint Sources	City of Charlotte (CMUD) Currently Upgrading WWTP to Give Improved Treatment Under Low Flow Conditions
	Recreation	NS-Fecal Coliform (Both Sites)	N.C. Point & Nonpoint Sources	City of Charlotte (CMUD) Currently Upgrading WWTP to Give Improved Treatment Under Low Flow Conditions
Little Sugar Creek	Recreation	NS-Fecal Coliform	N.C. Point & Nonpoint Sources	City of Charlotte (CMUD) Currently Upgrading WWTP to Give Improved Treatment Under Low Flow Conditions
Steele Creek (4 Sites)	Aquatic Life	PS-Dissolved Oxygen (Upstream Site)	Point Source	Revise Permit Limits
			Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Revise Permit Limits
			Nonpoint Source	Further Evaluation
03050103-038 Twelvemile Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Sixmile Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Waxhaw Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050103-042 Cane Creek (3 Sites)	Aquatic Life	PS,NS-Dissolved Oxygen (Up- & Downstream Sites)	Point Source	Discharge Eliminated
	Recreation	NS,PS - Fecal Coliform (Up- & Downstream Sites)	Point Source	Discharge Eliminated

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
Gills Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Bear Creek (2 Sites)	Aquatic Life	PS-Dissolved Oxygen (Upstream Site)	Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform (Both Sites)		
Rum Creek	Aquatic Life	NS-Dissolved Oxygen, Chromium	Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform		
03050103-050 Fishing Creek* (5 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Revise Permit Limits
03050103-060* Fishing Creek (4 Sites)	Recreation	NS-(Upstream & Midstream Sites); PS-(Downstream Site) Fecal Coliform	Point Source	Revise Permit Limits
Wildcat Creek* (3 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Nonpoint Source	Further Evaluation
Tools Fork	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050103-070 Tinkers Creek	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050103-080 Camp Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050103-090 Rocky Creek* (3 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Revise Permit Limits
			Nonpoint Source	Further Evaluation
Grassy Run Branch*	Aquatic Life	NS-Dissolved Oxygen	Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform		
03050104-010 Wateree Lake* (3 Sites)	Aquatic Life	NS-(2 Upstream Sites), PS-(Dam Site) Cadmium, Zinc, Chromium, Copper	Multiple Factors	Continue Evaluation

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
McCulley Creek	-----	Ground Water-Petroleum Products	Nonpoint Source	Currently Under Enforcement Action
Little Wateree Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050104-020 Big Wateree Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050104-030 Wateree River* (4 Sites)	Aquatic Life	NS-Dissolved Oxygen (2 Upstream Sites)	Water Volume and Flow Restricted by Impoundment	Study Evaluating Dischargers For Wasteload Allocation Underway
03050104-050 Sawneys Creek* (2 Sites)	Recreation	NS-Fecal Coliform (Both Sites)	Nonpoint Source	Further Evaluation
03050104-060 Twentyfive Mile Creek	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
Bear Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
	Aquatic Life	PS-Zinc	Unknown	Continue Evaluation
03050104-070 Big Pine Tree Creek* (2 Sites)	Recreation	PS-Fecal Coliform (Downstream Site)	Nonpoint Source	Further Evaluation
Little Pine Tree Creek	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050104-090 Spears Creek (2 Sites)	Recreation	PS-(Upstream), NS-(Downstream) Fecal Coliform	Nonpoint Source	Further Evaluation
	---	Ground Water-Organics, Chromium	Nonpoint Source	2 Sites - Assessment & Remediation Phase, & Remedial Action in Progress
03050111-010 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Stream from GSX New Sediment. Pond	Aquatic Life	NS-pH	Unknown	Further Evaluation
Spring Grove Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Special Study Ongoing
Big Poplar Creek	Aquatic Life	NS-Dissolved Oxygen	Unknown	Further Evaluation
Diversion Canal*	Aquatic Life	PS-Copper & Zinc	Unknown	Continue Evaluation

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
03050111-020 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Halfway Swamp Creek (2 Sites)	Recreation	NS-(Upstream), PS-(Downstream) Fecal Coliform	Nonpoint Source	Further Evaluation
Lake Inspiration*	Aquatic Life	PS-pH, Dissolved Oxygen	Dredge & Fill Operations	Continue Evaluation
	Recreation	PS-Fecal Coliform		
03050111-030 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Jacks Creek*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
Big Branch	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050111-040 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Tawcaw Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050111-050 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Potato Creek Arm*	Aquatic Life	NS-Zinc	Unknown	Continue Evaluation
03050112-010 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Santee River*	Aquatic Life	PS-Dissolved Oxygen	Hydrologic Modification Related Effect	Continue Evaluation
03050112-020 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
03050112-030 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Santee River*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050112-040 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
03050112-050 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Mechaw Creek*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050112-060 North Santee River*	Aquatic Life	PS-Dissolved Oxygen	Sampling Bias	Re-evaluate Monitoring Site

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	SE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
03050201-010 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Duck Pond Creek	Aquatic Life	NS-pH, Dissolved Oxygen	Point Source	System Upgraded
	Recreation	PS-Fecal Coliform	Point Source	System Upgraded
Lake Moultrie Trib near Cross Gen. Sta.	Aquatic Life	PS-Dissolved Oxygen	Unknown	Further Evaluation
	Recreation	PS-Fecal Coliform		
Lake Moultrie Trib	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050201-020 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Wadboo Swamp	Recreation	PS-Fecal Coliform	Point Source	Revise Permit Limits
Walker Swamp	Recreation	NS-Fecal Coliform	Nonpoint Source & Low Flow	Further Evaluation
03050201-030 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
03050201-040 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
03050201-050 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Cooper River* (7 Sites)	Recreation	NS-(Midstream); PS-(Midstream & Downstream Sites) Fecal Coliform	Point Source	Additional Data Gathering by Point Source
			Nonpoint Source	Further Evaluation
	----	Ground Water-Chromium, Nitrates, Metals, Organics	Nonpoint Source	3 Sites in Various Phases of Assessment & Monitoring
Filbin Creek	Aquatic Life	PS-Dissolved Oxygen	Nonpoint Sources	Further Evaluation
	Recreation	NS-Fecal Coliform	Point & Nonpoint Sources	Further Evaluation

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
Shipyard Creek*	Aquatic Life	NS-Sediment contaminated by Metals & Organics	Point & Nonpoint Sources & Poor Flushing	Enforcement Action Ongoing
	—	Ground Water-Organics	Nonpoint Source	Currently in Assessment Phase
03050201-060 All Streams	Fish Consumption	PS-Mercury	Unknown	Continue Evaluation
Foster Creek*	Aquatic Life	NS-Dissolved Oxygen	Overflowing Manhole	Evaluate for Enforcement Action
			Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform	Overflowing Manhole	Evaluate for Enforcement Action
			Nonpoint Source	Further Evaluation
03050201-070 Goose Creek* (2 Sites)	Aquatic Life	NS (Above Reservoir)-pH & Dissolved Oxygen	Overflowing Manhole	Evaluate for Enforcement Action
		PS (Below Reservoir)-Zinc	Nonpoint Sources	Further Evaluation
	Recreation	PS-(Above), NS-(Below) Fecal Coliform	Overflowing Manhole	Evaluate for Enforcement Action
			Nonpoint Source	Further Evaluation
Goose Creek Reservoir* (3 Sites)	Aquatic Life	NS-Dissolved Oxygen (All Sites)	Overabundance of Aquatic Vegetation	Integrate Aquatic Plant Management Strategy with Harvesting, Grass Carp Stocking, Herbicide Application, & Sediment Removal
03050201-080 Wando River* (2 Sites)	Aquatic Life	NS-Copper, Zinc, & Cadmium (Upstream Site)	Point Source & Shipyard Operations	NPDES Permit Compliance
03050202-010 Wassamassaw Swamp	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050202-020 Ashley River*	Aquatic Life	NS-Dissolved Oxygen	Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform		

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
03050202-030 Dorchester Creek	Aquatic Life	PS-Dissolved Oxygen	Nonpoint Source	Further Evaluation
	Recreation	NS-Fecal Coliform		
Sawmill Branch	Aquatic Life	NS-Dissolved Oxygen	Point Source	Revise Permit Limits; Plant Upgrade
	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Eagle Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050202-040 Ashley River* (4 Sites)	Aquatic Life	NS-Dissolved Oxygen (4 Upstream Sites)	Point Source	Revise Permit Limits; Plant Upgrade
	Recreation	NS-(2 Upstream), PS-(2 Downstream) Fecal Coliform	Point Source	Revise Permit Limits; Plant Upgrade
			Nonpoint Source	Further Evaluation
	—	Ground Water-Organics	Nonpoint Source	Currently in Assessment Phase; Enforcement is Pending
Church Creek	Recreation	NS-Fecal Coliform	Point Source	Revise Permit Limits; Plant Upgrade
			Nonpoint Source	Further Evaluation
03050202-050 Elliott Cut	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Log Bridge Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050202-060 Awendaw Creek	Recreation	NS-Fecal Coliform	Nonpoint Source-Septic Tank Failure	Further Evaluation
Jeremy Creek	Recreation	PS-Fecal Coliform	Nonpoint Source-Shrimp Boat Dockage; Septic Tank Failure	Further Evaluation
03050202-070 Charleston Harbor (4 Sites)	Recreation	PS-Fecal Coliform (Ashley R. Mouth)	Nonpoint Source	Further Evaluation
Stono River* (3 Sites)	Aquatic Life	NS-Dissolved Oxygen & Metals (Upstream Site)	Nonpoint Source-Shrimp Boat Dockage; Septic Tank Failure	Further Evaluation
James Island Creek	—	Ground Water-Organics	Nonpoint Source	In Remediation Phase

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED STRATEGY
Shem Creek*	Aquatic Life	PS-Dissolved Oxygen	Nonpoint Source-Shrimp Boat Dockage; Septic Tank Failure	Further Evaluation
	Recreation	PS-Fecal Coliform		

UNIMPAIRED WATERS WITH NOTABLE TRENDS

The waters listed in this table are not impaired, but rather display long-term trends that bear following, primarily with continued monitoring. (DO=Dissolved Oxygen, TB=Turbidity; Zn=Zinc)

WATERSHED WATERBODY	CONCERN	POSSIBLE SOURCE	RECOMMENDED ACTION
03050103-010 Fishing Creek Reservoir	Increasing Trend in pH, TB; Declining Trend in DO	Nonpoint Source	Continue Evaluation
03050111-010 Lake Marion	Declining Trend in pH	Unknown	Continue Evaluation
03050112-020 Rediversion Canal	Declining Trend in DO	Unknown	Continue Evaluation
03050112-060 South Santee River	Declining Trend in pH	Unknown	Continue Evaluation
03050201-010 Tail Race Canal	Declining Trends in pH & DO	Unknown	Continue Evaluation
03050201-030 West Branch Cooper River	Declining Trend in pH	Unknown	Continue Evaluation
03050202-010 Cypress Swamp	Elevated Zn	Unknown	Continue Evaluation
03050202-050 Wappoo Creek	Declining Trend in DO	Unknown	Continue Evaluation
03050202-060 Intracoastal Waterway	Increasing Trend in TB; Declining Trend in DO	Nonpoint Source	Continue Evaluation
03050202-070 Charleston Harbor	Increasing Trends in TB & pH; Declining Trend in DO	Unknown	Continue Evaluation
The Cove	Declining Trend in DO	Unknown	Continue Evaluation
Kiawah River	Declining Trend in DO	Unknown	Continue Evaluation

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APPENDIX A. WMU-0301

Monitoring Station Descriptions

STATION TYPES (P=PRIMARY, S=SECONDARY, W=WATERSHED, SC=SANTEE COOPER, I=INACTIVE)
CLASS (FW=FRESHWATER)

STA.#	TYPE	CLASS	STATION DESCRIPTION
03050101-190			
CW-197	P	FW	LAKE WYLIE ABOVE MILL CREEK ARM AT END OF S-46-557
CW-192	S	FW	S.FORK CROWDERS CREEK AT S-46-79 4.5 MI NW OF CLOVER
CW-152	P	FW	CROWDERS CREEK AT US 321 0.5 MI N OF NC STATE LINE
CW-023	P	FW	CROWDERS CREEK AT S-46-564 NE CLOVER
CW-024	W	FW	CROWDERS CREEK AT S-46-1104
CW-105	S	FW	BROWN CREEK AT UNIMP RD 1.2 MI N OF CLOVER BELOW PLANT
CW-153	S	FW	BEAVERDAM CREEK AT S-46-152 8 MI E OF CLOVER
CW-027	S	FW	LAKE WYLIE, CROWDERS CK ARM AT SC 49 AND SC 274
CW-245	W	FW	LAKE WYLIE, CROWDERS CK ARM-1ST POWERLINES UPSTR OF MAIN POOL
CW-198	P	FW	LAKE WYLIE, OUTSIDE MOUTH OF CROWDERS CREEK ARM
CW-201	P	FW	LAKE WYLIE, NORTH LAKEWOODS SUBDIVISION AT EBENEZER ACCESS
CW-230	W	FW	LAKE WYLIE AT DAM, UNDER POWERLINES
03050101-200			
CW-171	S	FW	ALLISON CREEK AT US 321 3.1 MI S OF CLOVER
CW-134	S	FW	CALABASH BRANCH AT S-46-414 2.5 MI SE OF CLOVER
CW-200	S	FW	LAKE WYLIE, ALLISON CREEK ARM AT SC 274 9 MI NE OF YORK
03050103-010			
CW-221	S	FW	CATAWBA RIVER TRIB AT HWY 161 0.4 MI W OF I-77
CW-014	P	FW	CATAWBA RIVER AT US 21
CW-041	P	FW	CATAWBA RIVER AT SC 5 ABOVE BOWATER
CW-016	P	FW	CATAWBA RIVER AT SC 9 AT FORT LAWN
CW-016F	P	FW	FISHING CREEK RESERVOIR 2 MI BELOW CANE CREEK
CW-057	P	FW	FISHING CREEK RESERVOIR 75 FT ABOVE DAM NEAR GREAT FALLS
CW-174	S	FW	CATAWBA R. AT UNIMPROVED ROAD ABOVE JUNCTION WITH ROCKY CREEK
03050103-028			
CW-247	W	FW	SUGAR CREEK AT MECKLENBURG CO ROAD 51 (IN N.C.)
CW-248	W	FW	LITTLE SUGAR CREEK AT US 521 (IN N.C.)
CW-246	W/BIO	FW	SUGAR CREEK UPSTREAM OF CONFLUENCE WITH MCALPINE CREEK
CW-226	P	FW	MCALPINE CREEK AT US 521 IN NC
CW-064	S/BIO	FW	MCALPINE CREEK AT S-29-64
CW-009	S	FW	STEELE CREEK AT S-46-22 N OF FORT MILL
CW-203	W	FW	STEELE CREEK AT S-46-98
CW-681	BIO	FW	STEELE CREEK AT BY-PASS US 21
CW-011	S	FW	STEELE CREEK AT S-46-270
CW-013	P	FW	SUGAR CREEK AT SC 160 E OF FORT MILL
CW-036	S	FW	SUGAR CREEK AT S-46-36

03050103-038

CW-176	P	FW	SIXMILE CREEK AT S-29-54
CW-083	S	FW	TWELVEMILE CREEK AT S-29-55 0.3 MI NW OF VAN WYCK
CW-145	W	FW	WAXHAW CREEK AT S-29-29

03050103-042

CW-185	S	FW	CANE CREEK AT SC 200 5 MI NNE OF LANCASTER
CW-210	BIO	FW	CANE CREEK AT SC 9
CW-151	S	FW	BEAR CREEK AT S-29-362 3.5 MI SE OF LANCASTER
CW-047	S	FW	GILLS CREEK AT US 521 NNW OF LANCASTER
CW-131	S	FW	BEAR CREEK AT S-29-292 1.6 MI W OF LANCASTER
CW-017	S	FW	CANE CREEK AT S-29-50
CW-232	W	FW	RUM CREEK AT S-29-187

03050103-050

CW-029	P	FW	FISHING CREEK AT SC 49 NE YORK
CW-031	BIO	FW	FISHING CREEK AT SC 161
CW-642	BIO	FW	FISHING CREEK UPSTREAM OF YORK WWTP OFF S-46-1172
CW-005	P/BIO	FW	FISHING CREEK AT S-46-347 DOWNSTREAM OF YORK WWTP
CW-225	S/BIO	FW	FISHING CREEK AT S-46-503

03050103-060

CW-006	S	FW	WILDCAT CREEK AT S-46-650
CW-212	S	FW	TOOLS FORK AT S-46-195 7 MI NW OF ROCK HILL
CW-096	S/BIO	FW	WILDCAT CREEK AT S-46-998 9 MI ENE OF MCCONNELLS
CW-650	BIO	FW	WILDCAT CK 20 METERS UPSTREAM OF CONFLUENCE WITH FISHING CREEK,
CW-224	S/BIO	FW	FISHING CREEK AT S-46-163
CW-654	BIO	FW	FISHING CREEK AT S-46-655
CW-008	P	FW	FISHING CREEK AT SC 223 NE RICHBURG
CW-233	W	FW	FISHING CREEK AT S-12-77

03050103-070

CW-227	S	FW	NEELYS CREEK AT 2-46-997
CW-234	W	FW	TINKERS CREEK AT S-12-599

03050103-080

CW-235	W	FW	CAMP CREEK AT SC 97

03050103-090

CW-088	S	FW	GRASSY RUN BRANCH AT SC 72 1.6 MI NE CHESTER
CW-002	P/BIO	FW	ROCKY CREEK AT S-12-335 3.5 MI E OF CHESTER
CW-067	BIO	FW	LITTLE ROCKY CREEK AT S-12-144
CW-236	W	FW	ROCKY CREEK AT S-12-138
CW-175	S	FW	ROCKY CREEK AT S-12-141 SE OF GREAT FALLS

03050104-010

CW-231	W	FW	CATAWBA R. 50 YDS DOWNSTREAM OF CEDAR CK CONFLUENCE
CW-040	S	FW	LITTLE WATEREE CREEK AT S-20-41 5 MI E OF WINNSBORO
CW-208	P	FW	WATEREE LAKE, DUTCHMANS CK ARM AT S-20-101 11 MI ENE WINNSBORO
CW-207	P	FW	WATEREE LAKE AT END OF S-20-291
CW-209	P	FW	WATEREE LAKE AT SMALL ISLAND 2.3 MI N OF DAM

03050104-020

CW-072	W	FW	BIG WATEREE CREEK AT US 21

03050104-030

CW-019	S	FW	WATEREE RIVER AT US 1
CW-214	S(I)	FW	WATEREE RIVER AT I-20
CW-206	P	FW	WATEREE RIVER AT US 76 & 378
CW-222	P	FW	WATEREE RIVER 1.6 MI UPSTREAM CONFLUENCE WITH CONGAREE
SC-002	SC	FW	WATEREE RIVER 1.6 MI UPSTREAM CONFLUENCE WITH CONGAREE

03050104-040

CW-078	BIO	FW	GRANNIES QUARTER CREEK AT S-28-58
CW-237	W	FW	GRANNIES QUARTER CREEK AT SC 97

03050104-050

CW-228	P/BIO	FW	SAWNEYS CREEK AT S-20-151
CW-079	W	FW	SAWNEYS CREEK AT S-28-37

03050104-060

CW-229	P	FW	BEAR CREEK AT S-40-82
CW-080	S/BIO	FW	TWENTYFIVE MILE CREEK AT S-28-05 3.7 MI W OF CAMDEN

03050104-070

CW-213	S(I)	FW	BIG PINE TREE CREEK AT I-20
CW-223	S/BIO	FW	LITTLE PINE TREE CREEK AT S-28-132
CW-021	W	FW	BIG PINE TREE CREEK AT US 521, NW BRIDGE

03050104-080

CW-238	W	FW	SWIFT CREEK AT SC 261

03050104-090

CW-154	S/BIO	FW	KELLY CREEK AT S-28-367 2.9 MI SE OF ELGIN
CW-155	P/BIO	FW	SPEARS CREEK AT SC 12 3.6 MI SE OF ELGIN
CW-166	W	FW	SPEARS CREEK AT US 601

03050104-100

CW-240	W	FW	COLONELS CREEK AT US 601

Water Quality Trends and Status by Station

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

- P = Primary station, sampled monthly all year round
- S = Secondary station, sampled monthly May - October
- CS = Special station added for the Catawba/Santee basin study
- I* = Currently inactive station which had some data within the period reviewed
- SC = Station sampled by Santee-Cooper Public Service Authority

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations:

DO	Dissolved Oxygen	NH3	Ammonia
BOD	Five-Day Biochemical Oxygen Demand	CD	Cadmium
pH	pH	CR	Chromium
TP	Total Phosphorus	CU	Copper
TN	Total Nitrogen	PB	Lead
TURB	Turbidity	HG	Mercury
TSS	Total Suspended Solids	NI	Nickel
BACT	Fecal Coliform Bacteria	ZN	Zinc

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January, 1989 and December, 1993
For trends, number of surface samples collected between January, 1980 and December, 1993

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples which contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January, 1989 and December, 1993. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change in concentration per year

Key to Trends:

D Statistically significant decreasing trend in parameter concentration

I Statistically significant increasing trend in parameter concentration

* No statistically significant trend

Blank Insufficient data to test for long term trends

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050101190																				
CW-197	P	LAKE WYLIE	FW	65	1	2	4.4	D	152	-0.1	D	125	-0.04	63	0	0		*	150	
CW-192	S	S FORK CROWDERS CK	FW	30	0	0		*	59		D	58	-0.1	30	0	0		*	59	
CW-152	P	CROWDERS CK	FW	58	0	0		*	88		*	87		58	1	2	9.95	I	88	0.033
CW-023	P	CROWDERS CK	FW	58	0	0		*	122		D	119	-0.263	58	0	0		I	122	0.026
CW-024	CS	CROWDERS CK	FW	6	0	0								6	0	0				
CW-105	S	BROWN CK	FW	29	0	0		I	57	0.307	D	55	-0.455	29	1	3	5.9	*	57	
CW-153	S	BEAVERDAM CK	FW	30	0	0		*	55		D	54	-0.1	30	0	0		*	55	
CW-027	S	LAKE WYLIE	FW	30	0	0		D	60	-0.15	*	59		30	1	3	8.6	*	60	
CW-245	CS	LAKE WYLIE	FW	25	1	4	4.7							25	4	16	8.75			
CW-198	P	LAKE WYLIE	FW	64	0	0		D	164	-0.075	D	124	-0.06	63	3	5	8.733	I	163	0.033
CW-201	P	LAKE WYLIE	FW	67	0	0		D	154	-0.1	D	123	-0.088	66	4	6	8.825	I	149	0.033
CW-230	CS	LAKE WYLIE	FW	12	1	8	4.5							12	2	17	8.625			
03050101200																				
CW-171	S	ALLISON CK	FW	30	0	0		*	58		D	57	-0.067	30	0	0		*	58	
CW-134	S	CALABASH BRANCH	FW	30	0	0		*	58		D	56	-0.317	30	0	0		I	58	0.04
CW-200	S	LAKE WYLIE	FW	30	0	0		*	58		D	57	-0.107	30	0	0		*	58	
03050103010																				
CW-221	S	CATAWBA RVR TRIB	FW	30	1	3	4.5	*	59		D	58	-0.083	30	0	0		*	59	
CW-014	P	CATAWBA RVR	FW	20	3	15	3.533							20	0	0				
CW-041	P	CATAWBA RVR	FW	58	0	0		*	121		D	119	-0.175	58	1	2	8.6	I	120	0.02
CW-016	P	CATAWBA RVR	FW	61	0	0		D	163	-0.05	D	126	-0.029	60	3	5	7.547	I	157	0.044
CW-016F	P	FISHING CK RESERVOIR	FW	63	0	0		D	142	-0.057	*	122		61	2	3	8.925	I	138	0.05
CW-057	P	FISHING CK RESERVOIR	FW	60	1	2	4.2	*	141		*	123		60	9	15	8.956	I	139	0.069
CW-174	S	CATAWBA RVR	FW	30	5	17	4.37	*	58		D	57	-0.1	30	0	0		*	58	
03050103028																				
CW-247	CS	SUGAR CK	FW	11	1	9	4.75							11	0	0				
CW-248	CS	LITTLE SUGAR CK	FW	11	0	0								11	0	0				
CW-246	CS	SUGAR CK	FW	10	0	0								11	0	0				
CW-226	P	MCALPINE CK	FW	55	2	4	4.9	*	55		*	50		55	0	0		*	42	
CW-064	S	MCALPINE CK	FW	35	9	26	4.2	*	64		D	58	-0.157	35	0	0		*	64	
CW-009	S	STEELE CK	FW	34	6	18	4.417	*	62		D	56	-0.2	34	0	0		*	62	
CW-203	CS	STEELE CK	FW	11	1	9	4.25							11	0	0				
CW-011	S	STEELE CK	FW	35	0	0		*	64		D	58	-0.12	35	0	0		I	64	0.043
CW-013	P	SUGAR CK	FW	61	3	5	4.417	I	90	0.15	D	84	-0.371	61	1	2	8.85	I	90	0.02
CW-036	S	SUGAR CK	FW	34	1	3	4.8	*	34					34	0	0		*	34	

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050101190															
CW-197	P	LAKE WYLIE	FW	D	125	-0.003	*	120		*	129				
CW-192	S	S FORK CROWDERS CK	FW	D	55	-0.005				D	58	-0.367			
CW-152	P	CROWDERS CK	FW	*	84		*	59		*	87				
CW-023	P	CROWDERS CK	FW	*	116		*	110		*	121				
CW-024	CS	CROWDERS CK	FW												
CW-105	S	BROWN CK	FW	D	54	-0.16				*	56				
CW-153	S	BEAVERDAM CK	FW	D	52	-0.01				*	54				
CW-027	S	LAKE WYLIE	FW	*	55					*	59				
CW-245	CS	LAKE WYLIE	FW												
CW-198	P	LAKE WYLIE	FW	D	124	-0.003	D	118	-0.018	*	128				
CW-201	P	LAKE WYLIE	FW	D	121	-0.004	D	115	-0.018	*	127				
CW-230	CS	LAKE WYLIE	FW												
03050101200															
CW-171	S	ALLISON CK	FW	D	55	-0.002				D	55	-0.8			
CW-134	S	CALABASH BRANCH	FW	*	55					*	58				
CW-200	S	LAKE WYLIE	FW	D	54	-0.003				*	57				
03050103010															
CW-221	S	CATAWBA RVR TRIB	FW	D	55	-0.005				*	58				
CW-014	P	CATAWBA RVR	FW												
CW-041	P	CATAWBA RVR	FW	D	117	-0.012	D	110	-0.054	*	121				
CW-016	P	CATAWBA RVR	FW	D	126	-0.008	D	119	-0.029	*	130		*	33	
CW-016F	P	FISHING CK RESERVOIR	FW	D	124	-0.007	*	120		I	126	0.431			
CW-057	P	FISHING CK RESERVOIR	FW	D	122	-0.006	*	121		*	127				
CW-174	S	CATAWBA RVR	FW	*	51					*	56				
03050103028															
CW-247	CS	SUGAR CK	FW												
CW-248	CS	LITTLE SUGAR CK	FW												
CW-246	CS	SUGAR CK	FW												
CW-226	P	MCALPINE CK	FW	*	43		I	43	0.912	*	49				
CW-064	S	MCALPINE CK	FW	D	54	-0.237				*	59				
CW-009	S	STEELE CK	FW	*	53					D	57	-0.59			
CW-203	CS	STEELE CK	FW												
CW-011	S	STEELE CK	FW	D	53	-0.007				*	59				
CW-013	P	SUGAR CK	FW	D	78	-0.11	I	44	0.677	*	84				
CW-036	S	SUGAR CK	FW												

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				BACT	BACT	BACT	MEAN	TRENDS			NH3	NH3	CD	CD	CD
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	N	EXC.	MED.
03050101190															
CW-197	P	LAKE WYLIE	FW	57	0	0		*	128		54	0	18	0	DL
CW-192	S	S FORK CROWDERS CK	FW	30	11	37	1687	*	58		6	0	2	0	DL
CW-152	P	CROWDERS CK	FW	58	28	48	1465	*	88		54	0	17	0	DL
CW-023	P	CROWDERS CK	FW	58	27	47	3644	*	122		54	0	16	0	DL
CW-024	CS	CROWDERS CK	FW	6	2	33	2200				6	0	2	0	DL
CW-105	S	BROWN CK	FW	29	26	90	2454	*	57						
CW-153	S	BEAVERDAM CK	FW	30	9	30	2663	*	55						
CW-027	S	LAKE WYLIE	FW	30	1	3	1700	D	60	-8.8					
CW-245	CS	LAKE WYLIE	FW	10	0	0					23	0	2	0	DL
CW-198	P	LAKE WYLIE	FW	58	0	0		D	128	-0.25	52	0	19	0	DL
CW-201	P	LAKE WYLIE	FW	58	0	0		*	125		54	0	19	0	DL
CW-230	CS	LAKE WYLIE	FW	11	0	0					11	0	4	0	DL
03050101200															
CW-171	S	ALLISON CK	FW	30	16	53	1029	D	58	-30.75					
CW-134	S	CALABASH BRANCH	FW	30	25	83	2575	*	58						
CW-200	S	LAKE WYLIE	FW	30	0	0		*	58						
03050103010															
CW-221	S	CATAWBA RVR TRIB	FW	30	13	43	2089	*	59						
CW-014	P	CATAWBA RVR	FW	20	0	0					18	0	5	0	DL
CW-041	P	CATAWBA RVR	FW	57	1	2	1200	D	120	-4.6	54	0	18	0	DL
CW-016	P	CATAWBA RVR	FW	57	1	2	3900	D	129	-4.438	55	0	20	0	DL
CW-016F	P	FISHING CK RESERVOIR	FW	56	1	2	2000	D	125	-3.571	56	0	20	0	DL
CW-057	P	FISHING CK RESERVOIR	FW	57	2	4	600	D	126	-1.167	53	0	20	0	DL
CW-174	S	CATAWBA RVR	FW	29	3	10	2367	I	57	2.55					
03050103028															
CW-247	CS	SUGAR CK	FW	11	5	45	1852				6	0	2	0	DL
CW-248	CS	LITTLE SUGAR CK	FW	11	11	100	1779				5	0	2	0	DL
CW-246	CS	SUGAR CK	FW	11	6	55	2285				6	0	2	0	DL
CW-226	P	MCALPINE CK	FW	55	24	44	2632.5	I	55	225	44	0	18	0	DL
CW-064	S	MCALPINE CK	FW	35	16	46	3628	I	64	33.667	7	0	3	0	DL
CW-009	S	STEELE CK	FW	34	13	38	1676	*	62		6	0	2	0	DL
CW-203	CS	STEELE CK	FW	11	5	45	880				6	0	2	0	DL
CW-011	S	STEELE CK	FW	35	24	69	3206	*	64		6	0	2	0	DL
CW-013	P	SUGAR CK	FW	61	42	69	2895	I	90	63	43	0	17	0	DL
CW-036	S	SUGAR CK	FW	34	20	59	3460	*	34		12	0	5	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050101190																		
CW-197	P	LAKE WYLIE	FW	18	0	DL	18	2	18	0	DL	18	0	DL	18	0	18	1
CW-192	S	S FORK CROWDERS CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-152	P	CROWDERS CK	FW	17	0	DL	16	3	17	0	DL	17	0	DL	17	0	17	2
CW-023	P	CROWDERS CK	FW	16	0	DL	16	2	16	0	DL	16	0	DL	16	0	16	2
CW-024	CS	CROWDERS CK	FW	2	0	DL	2	1	2	0	DL	2	0	DL	2	0	2	0
CW-105	S	BROWN CK	FW															
CW-153	S	BEAVERDAM CK	FW															
CW-027	S	LAKE WYLIE	FW									1	0	DL				
CW-245	CS	LAKE WYLIE	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-198	P	LAKE WYLIE	FW	19	0	DL	19	1	19	0	DL	19	0	DL	19	0	19	0
CW-201	P	LAKE WYLIE	FW	19	1	DL	19	1	19	0	DL	20	0	DL	19	0	19	1
CW-230	CS	LAKE WYLIE	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	0
03050101200																		
CW-171	S	ALLISON CK	FW															
CW-134	S	CALABASH BRANCH	FW															
CW-200	S	LAKE WYLIE	FW															
03050103010																		
CW-221	S	CATAWBA RVR TRIB	FW				1	1									1	1
CW-014	P	CATAWBA RVR	FW	5	0	DL	5	1	5	0	DL	5	0	DL	5	0	5	1
CW-041	P	CATAWBA RVR	FW	18	0	DL	18	2	18	0	DL	19	0	DL	18	0	18	0
CW-016	P	CATAWBA RVR	FW	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	2
CW-016F	P	FISHING CK RESERVOIR	FW	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	0
CW-057	P	FISHING CK RESERVOIR	FW	20	0	DL	20	1	20	0	DL	20	0	DL	20	0	20	1
CW-174	S	CATAWBA RVR	FW															
03050103028																		
CW-247	CS	SUGAR CK	FW	2	0	DL	2	1	2	0	DL	2	0	DL	2	0	2	0
CW-248	CS	LITTLE SUGAR CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-246	CS	SUGAR CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-226	P	MCALPINE CK	FW	18	0	DL	18	3	18	0	DL	17	0	DL	18	0	18	1
CW-064	S	MCALPINE CK	FW	3	0	DL	3	0	3	0	DL	2	0	DL	3	0	3	0
CW-009	S	STEELE CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-203	CS	STEELE CK	FW	2	0	DL	2	1	2	0	DL	2	0	DL	2	0	2	0
CW-011	S	STEELE CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-013	P	SUGAR CK	FW	17	0	DL	17	3	17	0	DL	17	0	DL	17	0	17	4
CW-036	S	SUGAR CK	FW	5	0	DL	5	0	5	0	DL	4	0	DL	5	0	5	1

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050103038																				
CW-176	P	SIXMILE CK	FW	56	0	0		*	56		*	56		56	0	0		D	56	-0.1
CW-083	S	TWELVEMILE CK	FW	35	2	6	4.525	*	64		D	63	-0.073	35	0	0		I	64	0.05
CW-145	CS	WAXHAW CK	FW	12	0	0								12	0	0				
03050103042																				
CW-185	S	CANE CK	FW	30	7	23	3.936	*	59		D	58	-0.071	30	0	0		*	59	
CW-151	S	BEAR CK	FW	32	6	19	2.8	*	52		*	52		32	1	3	4.15	*	52	
CW-047	S	GILLS CK	FW	30	2	7	3.45	I	59	0.1	D	57	-0.133	30	0	0		I	59	0.032
CW-131	S	BEAR CK	FW	30	1	3	4.8	I	59	0.119	D	58	-0.14	30	1	3	5.9	*	59	
CW-017	S	CANE CK	FW	37	21	57	2.936	*	65		*	62		36	1	3	5.7	*	64	
CW-232	CS	RUM CK	FW	12	4	33	1.9							12	0	0				
03050103050																				
CW-029	P	FISHING CK	FW	58	0	0		*	122		D	121	-0.1	28	1	2	11.31	*	122	
CW-005	P	FISHING CK	FW	8	0	0								8	0	0				
CW-225	S	FISHING CK	FW	30	0	0		D	30	-0.425	*	30		30	0	0		*	30	
03050103060																				
CW-006	S	WILDCAT CK	FW	30	3	10	4.63	*	60		D	59	-0.192	30	0	0		*	60	
CW-212	S	TOOLS FORK	FW	30	1	3	3	I	58	0.1	D	56	-0.242	30	0	0		*	58	
CW-096	S	WILDCAT CK	FW	30	3	10	4.5	I	59	0.108	D	58	-0.383	30	0	0		*	59	
CW-224	S	FISHING CK	FW	24	0	0								24	1	4	5.5			
CW-008	P	FISHING CK	FW	57	0	0		*	118		D	116	-0.094	57	0	0		*	118	
CW-233	CS	FISHING CK	FW	12	0	0								12	1	8	5.9			
03050103070																				
CW-227	S	NEELYS CK	FW	24	0	0								24	0	0				
CW-234	CS	TINKERS CK	FW	11	0	0								11	0	0				
03050103080																				
CW-235	CS	CAMP CK	FW	12	0	0								12	1	8	8.56			
03050103090																				
CW-088	S	GRASSY RUN BRANCH	FW	30	8	27	3.875	D	59	-0.15	D	58	-0.233	30	0	0		*	59	
CW-002	P	ROCKY CK	FW	58	3	5	4.367	D	120	-0.1	D	118	-0.1	58	0	0		*	120	
CW-236	CS	ROCKY CK	FW	12	0	0								12	0	0				
CW-175	S	ROCKY CK	FW	30	0	0		*	59		D	58	-0.125	30	0	0		*	59	

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050103038															
CW-176	P	SIXMILE CK	FW	I	51	0.015	I	48	0.09	*	55				
CW-083	S	TWELVEMILE CK	FW	*	60					*	64				
CW-145	CS	WAXHAW CK	FW												
03050103042															
CW-185	S	CANE CK	FW	*	56					*	59				
CW-151	S	BEAR CK	FW	*	47					*	52				
CW-047	S	GILLS CK	FW	*	56					*	59				
CW-131	S	BEAR CK	FW	D	54	-0.006				*	58				
CW-017	S	CANE CK	FW	D	59	-0.02				*	64				
CW-232	CS	RUM CK	FW												
03050103050															
CW-029	P	FISHING CK	FW	D	113	-0.001	D	106	-0.016	*	120				
CW-005	P	FISHING CK	FW												
CW-225	S	FISHING CK	FW							*	30				
03050103060															
CW-006	S	WILDCAT CK	FW	D	56	-0.015				*	59				
CW-212	S	TOOLS FORK	FW	D	54	-0.04				*	57				
CW-096	S	WILDCAT CK	FW	D	55	-0.023				*	58				
CW-224	S	FISHING CK	FW												
CW-008	P	FISHING CK	FW	D	114	-0.007	D	110	-0.03	*	115				
CW-233	CS	FISHING CK	FW												
03050103070															
CW-227	S	NEELYS CK	FW												
CW-234	CS	TINKERS CK	FW												
03050103080															
CW-235	CS	CAMP CK	FW												
03050103090															
CW-088	S	GRASSY RUN BRANCH	FW	D	55	-0.033				*	57				
CW-002	P	ROCKY CK	FW	D	116	-0.023	*	112		*	113				
CW-236	CS	ROCKY CK	FW												
CW-175	S	ROCKY CK	FW	*	56					*	57				

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				BACT	BACT	BACT	MEAN	TRENDS			NH3	NH3	CD	CD	CD
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	N	EXC.	MED.
03050103038															
CW-176	P	SIXMILE CK	FW	56	17	30	2458	*	56		50	0	21	0	DL
CW-083	S	TWELVEMILE CK	FW	35	13	37	1495	I	63	22.5	12	0	5	0	DL
CW-145	CS	WAXHAW CK	FW	12	6	50	940				10	0	4	0	DL
03050103042															
CW-185	S	CANE CK	FW	30	8	27	2631.2	*	58		5	0	2	0	DL
CW-151	S	BEAR CK	FW	32	9	28	1723	*	52						
CW-047	S	GILLS CK	FW	30	22	73	6278	*	59						
CW-131	S	BEAR CK	FW	30	22	73	4461	*	59						
CW-017	S	CANE CK	FW	36	9	25	3598	*	64		11	0	5	0	DL
CW-232	CS	RUM CK	FW	12	4	33	2775				11	0	4	0	DL
03050103050															
CW-029	P	FISHING CK	FW	58	15	26	1293	*	122		52	0	17	0	DL
CW-005	P	FISHING CK	FW	8	4	50	1067.5				7	0	2	0	DL
CW-225	S	FISHING CK	FW	30	15	50	1798	*	30		12	0	4	0	DL
03050103060															
CW-006	S	WILDCAT CK	FW	30	23	77	2604	I	59	94.143	6	0	2	0	DL
CW-212	S	TOOLS FORK	FW	30	28	93	1742	D	58	-97.4					
CW-096	S	WILDCAT CK	FW	30	12	40	2699	*	59		6	0	2	0	DL
CW-224	S	FISHING CK	FW	24	12	50	1554				6	0	2	0	DL
CW-008	P	FISHING CK	FW	56	15	27	2574	I	116	12.5	54	0	18	0	DL
CW-233	CS	FISHING CK	FW	12	3	25	2623				12	0	4	0	DL
03050103070															
CW-227	S	NEELYS CK	FW	23	1	4	600								
CW-234	CS	TINKERS CK	FW	11	3	27	1873				11	0	4	0	DL
03050103080															
CW-235	CS	CAMP CK	FW	12	4	33	2133				11	0	4	0	DL
03050103090															
CW-088	S	GRASSY RUN BRANCH	FW	30	29	97	2825	*	59						
CW-002	P	ROCKY CK	FW	57	23	40	2219	I	118	20	52	0	18	0	DL
CW-236	CS	ROCKY CK	FW	12	6	50	1568				12	0	4	0	DL
CW-175	S	ROCKY CK	FW	30	12	40	1101.7	*	59						

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050103038																		
CW-176	P	SIXMILE CK	FW	21	0	DL	21	3	21	0	DL	20	0	DL	21	0	21	1
CW-083	S	TWELVEMILE CK	FW	5	0	DL	5	0	5	0	DL	4	0	DL	5	0	5	0
CW-145	CS	WAXHAW CK	FW	4	0	DL	4	0	4	0	DL	3	0	DL	4	0	4	0
03050103042																		
CW-185	S	CANE CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-151	S	BEAR CK	FW															
CW-047	S	GILLS CK	FW															
CW-131	S	BEAR CK	FW															
CW-017	S	CANE CK	FW	5	0	DL	5	0	5	0	DL	4	0	DL	5	0	5	0
CW-232	CS	RUM CK	FW	4	1	DL	4	0	4	0	DL	3	0	DL	4	0	4	0
03050103050																		
CW-029	P	FISHING CK	FW	17	0	DL	17	2	16	0	DL	17	0	DL	17	0	17	1
CW-005	P	FISHING CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-225	S	FISHING CK	FW	4	0	DL	4	1	4	0	DL	4	0	DL	4	0	4	0
03050103060																		
CW-006	S	WILDCAT CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-212	S	TOOLS FORK	FW															
CW-096	S	WILDCAT CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-224	S	FISHING CK	FW	2	1	15	2	0	2	0	DL	2	0	DL	2	0	2	0
CW-008	P	FISHING CK	FW	18	0	DL	18	1	18	0	DL	17	0	DL	18	0	18	2
CW-233	CS	FISHING CK	FW	4	0	DL	4	1	4	0	DL	4	0	DL	4	0	4	0
03050103070																		
CW-227	S	NEELYS CK	FW															
CW-234	CS	TINKERS CK	FW	4	0	DL	4	1	4	0	DL	4	0	DL	4	0	4	0
03050103080																		
CW-235	CS	CAMP CK	FW	4	1	DL	4	0	4	0	DL	3	0	DL	4	0	4	0
03050103090																		
CW-088	S	GRASSY RUN BRANCH	FW															
CW-002	P	ROCKY CK	FW	18	0	DL	18	1	18	0	DL	17	0	DL	18	0	17	1
CW-236	CS	ROCKY CK	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	1
CW-175	S	ROCKY CK	FW															

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050104010																				
CW-231	CS	CATAWBA RVR	FW	11	1	9	4.1							11	0	0				
CW-040	S	LITTLE WATEREE CK	FW	23	1	4	4.8	*	52		*	49		23	0	0		*	50	
CW-208	P	WATEREE LAKE	FW	67	0	0		*	159		*	142		67	6	9	8.808	I	50	0.023
CW-207	P	WATEREE LAKE	FW	69	1	1	4.05	*	181		*	144		69	5	7	8.97	*	179	
CW-209	P	WATEREE LAKE	FW	68	1	1	4.05	D	168	-0.044	D	145	-0.025	68	2	3	8.615	*	167	
03050104020																				
CW-072	CS	BIG WATEREE CK	FW	11	0	0								11	0	0				
03050104030																				
CW-019	S	WATEREE RVR	FW	29	11	38	4.236	*	55		D	55	-0.08	29	0	0		*	54	
CW-214	I*	WATEREE RVR	FW	6	3	50	4.223	*	52		D	33	-0.19	6	0	0		I	50	0.03
CW-206	P	WATEREE RVR	FW	60	2	3	4.675	*	139		*	119		60	1	2	5.9	*	139	
CW-222	P	WATEREE RVR	FW	59	0	0		D	125	-0.05	*	112		59	1	2	5.95	*	125	
SC-002	SC	WATEREE RVR	FW	45	2	4	4.75							44	0	0				
03050104040																				
CW-237	CS	GRANNIES QUARTER CK	FW	11	0	0								11	0	0				
03050104050																				
CW-228	P	SAWNEYS CK	FW	42	0	0		*	42		*	42		41	0	0		D	41	-0.183
CW-079	CS	SAWNEYS CK	FW	11	0	0								11	0	0				
03050104060																				
CW-229	P	BEAR CK	FW	37	5	14	4.13	*	37		*	37		36	1	3	9.35	*	36	
CW-080	S	TWENTYFIVE MILE CK	FW	35	0	0		*	62		D	62	-0.086	35	1	3	5.7	*	61	
03050104070																				
CW-223	S	LITTLE PINE TREE CK	FW	28	1	4	3.95	*	54		D	53	-0.041	28	15	54	5.424	*	54	
CW-021	CS	BIG PINE TREE CK	FW	11	3	27	4.133							11	4	36	5.797			
CW-213	I*	BIG PINE TREE CK	FW	7	2	29	3.225	*	34		D	33	-0.142	7	2	29	5.775	D	34	-0.138
03050104080																				
CW-238	CS	SWIFT CK	FW	11	4	36	3.7							11	7	64	5.46			
03050104090																				
CW-154	S	KELLY CK	FW	29	1	3	3.7	*	56		D	56	-0.067	29	19	66	5.038	*	57	
CW-155	P	SPEARS CK	FW	36	1	3	4.05	I	64	0.125	D	63	-0.1	36	17	47	5.224	*	64	
CW-166	CS	SPEARS CK	FW	10	0	0								10	4	40	4.9			
03050104100																				
CW-240	CS	COLONELS CK	FW	12	0	0								12	5	42	5.68			

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050104010															
CW-231	CS	CATAWBA RVR	FW												
CW-040	S	LITTLE WATEREE CK	FW	D	49	-0.001				*	48				
CW-208	P	WATEREE LAKE	FW	D	143	-0.005	D	140	-0.02	I	141	0.214			
CW-207	P	WATEREE LAKE	FW	D	146	-0.005	D	141	-0.02	*	142				
CW-209	P	WATEREE LAKE	FW	D	146	-0.004	D	142	-0.022	*	144				
03050104020															
CW-072	CS	BIG WATEREE CK	FW												
03050104030															
CW-019	S	WATEREE RVR	FW	D	47	-0.003				*	52				
CW-214	I*	WATEREE RVR	FW							*	30				
CW-206	P	WATEREE RVR	FW	D	117	-0.003	D	113	-0.04	I	118	0.5	D	107	-0.5
CW-222	P	WATEREE RVR	FW	D	109	-0.002	D	109	-0.01	I	110	1.429	*	107	
SC-002	SC	WATEREE RVR	FW												
03050104040															
CW-237	CS	GRANNIES QUARTER CK	FW												
03050104050															
CW-228	P	SAWNEYS CK	FW	*	42		*	38		*	42				
CW-079	CS	SAWNEYS CK	FW												
03050104060															
CW-229	P	BEAR CK	FW	*	37		*	34		*	37				
CW-080	S	TWENTYFIVE MILE CK	FW	D	54	-0.004				*	59				
03050104070															
CW-223	S	LITTLE PINE TREE CK	FW	D	48	0				I	51	0.135			
CW-021	CS	BIG PINE TREE CK	FW												
CW-213	I*	BIG PINE TREE CK	FW							*	31				
03050104080															
CW-238	CS	SWIFT CK	FW												
03050104090															
CW-154	S	KELLY CK	FW	D	49	-0.001				*	53				
CW-155	P	SPEARS CK	FW	D	56	-0.005				I	60	0.35			
CW-166	CS	SPEARS CK	FW												
03050104100															
CW-240	CS	COLONELS CK	FW												

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION				BACT	BACT	BACT	MEAN	TRENDS			NH3	NH3	CD	CD	CD
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	N	EXC.	MED.
03050104010															
CW-231	CS	CATAWBA RVR	FW	10	0	0					9	0	3	0	DL
CW-040	S	LITTLE WATEREE CK	FW	22	11	50	1405	*	49						
CW-208	P	WATEREE LAKE	FW	59	0	0		*	144		59	0	20	1	DL
CW-207	P	WATEREE LAKE	FW	60	1	2	900	*	147		60	0	20	0	DL
CW-209	P	WATEREE LAKE	FW	56	0	0		I	147	0	57	0	20	0	DL
03050104020															
CW-072	CS	BIG WATEREE CK	FW	10	6	60	1342				10	0	3	0	DL
03050104030															
CW-019	S	WATEREE RVR	FW	29	0	0		*	55				1	0	DL
CW-214	I*	WATEREE RVR	FW	6	0	0		*	33						
CW-206	P	WATEREE RVR	FW	56	0	0		*	116		57	0	19	0	DL
CW-222	P	WATEREE RVR	FW	55	1	2	11000	*	110		55	0	55	0	DL
SC-002	SC	WATEREE RVR	FW	45	0	0					48	0			
03050104040															
CW-237	CS	GRANNIES QUARTER CK	FW	11	1	9	840				11	0	4	0	DL
03050104050															
CW-228	P	SAWNEYS CK	FW	42	17	40	8951.7	D	42	-108.25	42	0	14	1	DL
CW-079	CS	SAWNEYS CK	FW	11	5	45	722				11	0	4	0	DL
03050104060															
CW-229	P	BEAR CK	FW	37	14	38	1174.3	*	37		37	0	13	0	DL
CW-080	S	TWENTYFIVE MILE CK	FW	35	6	17	1713	*	62		11	0	4	0	DL
03050104070															
CW-223	S	LITTLE PINE TREE CK	FW	28	4	14	1315	*	54						
CW-021	CS	BIG PINE TREE CK	FW	11	2	18	1440				9	0	4	0	DL
CW-213	I*	BIG PINE TREE CK	FW	6	0	0		D	33	136.67					
03050104080															
CW-238	CS	SWIFT CK	FW	11	0	0					11	0	4	0	DL
03050104090															
CW-154	S	KELLY CK	FW	29	2	7	1060	*	55						
CW-155	P	SPEARS CK	FW	36	4	11	1298	*	62		17	0	7	0	DL
CW-166	CS	SPEARS CK	FW	10	3	30	880				9	0	3	0	DL
03050104100															
CW-240	CS	COLONELS CK	FW	10	0	0					10	0	4	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0301

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050104010																		
CW-231	CS	CATAWBA RVR	FW	3	0	DL	3	0	3	0	DL	3	0	DL	3	0	3	0
CW-040	S	LITTLE WATEREE CK	FW									1	0	DL				
CW-208	P	WATEREE LAKE	FW	20	2	DL	20	2	20	0	DL	20	0	DL	20	0	20	1
CW-207	P	WATEREE LAKE	FW	20	0	DL	20	3	20	0	DL	20	0	DL	20	0	19	2
CW-209	P	WATEREE LAKE	FW	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	3
03050104020																		
CW-072	CS	BIG WATEREE CK	FW	3	0	DL	3	0	3	0	DL	3	0	DL	3	0	3	0
03050104030																		
CW-019	S	WATEREE RVR	FW	1	0	DL	1	0	1	0	DL	1	0	DL	1	0	1	0
CW-214	I*	WATEREE RVR	FW															
CW-206	P	WATEREE RVR	FW	19	0	DL	19	1	19	0	DL	19	0	DL	19	0	19	0
CW-222	P	WATEREE RVR	FW	55	0	DL	55	4	55	0	DL	55	0	DL	55	0	55	4
SC-002	SC	WATEREE RVR	FW															
03050104040																		
CW-237	CS	GRANNIES QUARTER CK	FW	4	0	DL	4	0	4	0	DL	3	0	DL	4	0	4	0
03050104050																		
CW-228	P	SAWNEYS CK	FW	14	0	DL	14	0	14	0	DL	14	0	DL	14	0	14	2
CW-079	CS	SAWNEYS CK	FW	4	0	DL	4	0	4	0	DL	3	0	DL	4	0	4	1
03050104060																		
CW-229	P	BEAR CK	FW	13	0	DL	13	0	13	0	DL	13	0	DL	13	0	13	1
CW-080	S	TWENTYFIVE MILE CK	FW	4	0	DL	4	0	4	0	DL	3	0	DL	4	0	4	0
03050104070																		
CW-223	S	LITTLE PINE TREE CK	FW															
CW-021	CS	BIG PINE TREE CK	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	1
CW-213	I*	BIG PINE TREE CK	FW															
03050104080																		
CW-238	CS	SWIFT CK	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	0
03050104090																		
CW-154	S	KELLY CK	FW															
CW-155	P	SPEARS CK	FW	7	0	DL	7	0	7	0	DL	6	0	DL	7	0	7	0
CW-166	CS	SPEARS CK	FW	3	0	DL	3	0	3	0	DL	3	0	DL	3	0	3	0
03050104100																		
CW-240	CS	COLONELS CK	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	0

Mean Seasonal Water Quality Values

CATAWBA-SANTEE WMU-0301

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TEMPERATURE (°C)	Mean	17.5	24.1	16.0	8.7
	Max	28.0	33.5	26.0	17.0
	Min	7.0	12.5	4.0	0.0
	Med	18.0	24.0	16.0	9.0
	95%	24.0	30.0	22.0	13.0
	N	550	1247	413	385
DISSOLVED OXYGEN (mg/l)	Mean	8.4	6.8	8.0	10.2
	Max	15.0	12.0	14.0	13.4
	Min	0.9	0.7	2.0	6.7
	Med	8.4	6.9	8.0	10.2
	5%	5.8	4.2	5.6	8.5
	N	550	1250	413	383
pH (SU)	Mean	7.1	7.1	6.9	7.1
	Max	9.9	9.5	8.9	11.3
	Min	4.8	3.8	4.1	5.1
	Med	7.1	7.0	6.9	7.1
	95%	8.0	8.1	7.7	7.9
	N	547	1244	413	383
BOD_5 (mg/l)	Mean	1.9	1.9	1.6	1.7
	Max	8.5	33.0	8.8	20.0
	Min	0.1	0.1	0.1	0.0
	Med	1.5	1.4	1.3	1.3
	95%	4.3	4.4	3.6	3.8
	N	517	1131	402	367

CATAWBA-SANTEE WMU-0301

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TURBIDITY (NTU)	Mean	32.1	23.5	18.4	27.5
	Max	400.0	800.0	190.0	320.0
	Min	1.5	0.9	1.2	1.6
	Med	16.0	10.0	8.6	16.0
	95%	120.0	98.0	85.0	80.0
	N	515	1151	398	366
AMMONIA (mg/l)	Mean	0.17	0.19	0.16	0.21
	Max	1.15	2.40	1.50	3.00
	Min	0.02	0.01	0.05	0.04
	Med	0.12	0.10	0.10	0.12
	95%	0.53	0.68	0.57	0.73
	N	167	198	90	159
TKN (mg/l)	Mean	0.60	0.80	0.69	0.57
	Max	2.86	11.80	8.30	6.60
	Min	0.10	0.13	0.10	0.10
	Med	0.48	0.56	0.48	0.44
	95%	1.46	1.88	1.71	1.43
	N	342	547	244	341
NITRITE-NITRATE (mg/l)	Mean	0.66	1.13	1.14	0.65
	Max	8.80	108.00	16.80	9.50
	Min	0.02	0.01	0.02	0.02
	Med	0.32	0.28	0.28	0.38
	95%	2.80	5.70	6.70	2.50
	N	488	1022	358	327

CATAWBA-SANTEE WMU-0301

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TOTAL PHOSPHORUS (mg/l)	Mean	0.17	0.26	0.25	0.16
	Max	3.20	11.00	4.60	2.10
	Min	0.02	0.01	0.02	0.02
	Med	0.09	0.09	0.10	0.09
	95%	0.74	1.19	1.30	0.69
	N	487	1038	360	324
TOTAL ORGANIC CARBON (mg/l)	Mean	6.5	7.6	8.3	6.8
	Max	17.4	64.0	73.0	44.0
	Min	2.2	1.6	3.7	2.0
	Med	6.0	6.5	7.0	6.0
	95%	11.3	13.8	10.8	13.8
	N	142	274	50	148
FECAL COLIFORM BACTERIA (#/100ml)	Mean	158	178	104	96
	Max	66,000	130,000	16,000	8,100
	Min	1	1	1	1
	Med	160	220	120	100
	95%	4,700	3,400	2,400	1400
	N	507	1164	398	358

APPENDIX B. WMU-0302

Monitoring Station Descriptions

STATION TYPES (P=PRIMARY, S=SECONDARY, W=WATERSHED, SC=SANTEE COOPER, I=INACTIVE)
CLASS (FW=FRESHWATER)

STA.#	TYPE	CLASS	STATION DESCRIPTION
03050111-010			
SC-056	SC	FW	STREAM FROM NEW SEDIMENTATION POND AT GSX
SC-057	SC	FW	STREAM FROM OLD SEDIMENTATION POND AT GSX
SC-058	SC	FW	STREAM FROM TOUCHBERRY POND OFF GSX SITE
SC-005	SC	FW	LAKE MARION APPROX 0.9 MI NW OF RIMINI-LONE STAR RR TRESTLE
SC-003	SC	FW	BROADWATER CREEK 1.25 MI UPSTREAM OF CONFLUENCE WITH SANTEE R.
SC-004	SC	FW	SANTEE RIVER 0.1 MI UPSTREAM OF BROADWATER CREEK
ST-527	BIO	FW	TAVERN CREEK AT DIRT ROAD OFF S-43-808
SC-008	SC	FW	SANTEE R. AT SEABOARD COASTLINE RR TRESTLE 3.1 MI N OF LONE STAR
SC-009	SC	FW	SPRING GROVE CREEK AT S-14-26
SC-038	SC	FW	LAKE MARION AT MOUTH OF HALFWAY SWAMP CREEK
SC-039	SC	FW	LAKE MARION 1.25 MI SE OF RIMINI RR TRESTLE
SC-010	SC	FW	LAKE MARION AT CHANNEL MARKER 150
SC-044	SC	FW	LAKE MARION BETWEEN STUMPHOLE LANDING AND TREE LINE
SC-011	SC	FW	BIG POPLAR CREEK AT S-38-105
SC-012	SC	FW	LAKE MARION 0.6 MI SW OF JACKS CREEK EMBAYMENT
SC-045	SC	FW	UNNAMED STREAM FROM POND ON SANTEE NATIONAL GOLF COURSE
SC-014	SC	FW	LAKE MARION AT HEADWATERS OF CHAPEL BR FLOODED CREEK AT SANTEE
ST-025	P	FW	LAKE MARION, CHAPEL BR AT OLD US 301/15 BRIDGE AT SANTEE
SC-015	SC	FW	LAKE MARION AT OLD US 301/15 BRIDGE AT SANTEE
SC-042	SC	FW	LAKE MARION 0.5 MI W OF I-95/US 301 BRIDGE
SC-040	SC	FW	LAKE MARION AT USFWS CHANNEL MARKER 79
SC-041	SC	FW	LAKE MARION 2 MI N OF USFWS CHANNEL MARKER 79
SC-016	SC	FW	LAKE MARION AT USFWS CHANNEL MARKER 69
SC-036	SC	FW	LAKE MARION O.4 MI S OF TAWCAW CREEK EMBAYMENT
SC-021	SC	FW	LAKE MARION 0.9 MI NE OF ROCKS POND CAMPGROUND
SC-022	SC	FW	LAKE MARION AT CHANNEL MARKER 44
CSTL-079	P	FW	DIVERSION CANAL AT SC 45 12.6 MI W OF ST STEPHENS
SC-025	SC	FW	DIVERSION CANAL AT SC 45 12.6 MI W OF ST STEPHENS
03050111-020			
SC-006	SC	FW	WARLEY CREEK AT SC 267
C-058	S	FW	LAKE INSPIRATION - ST MATTHEWS (FRONT OF HEALTH DEPT)
C-063	S	FW	HALFWAY SWAMP CREEK AT S-09-43 3 MI E OF ST MATTHEWS
SC-007	SC	FW	HALFWAY SWAMP CREEK AT SC 33
CW-241	W	FW	HALFWAY SWAMP CREEK AT S-09-72
CW-242	W	FW	HALFWAY SWAMP CREEK TRIB AT S-09-158
03050111-030			
CW-243	W	FW	BIG BRANCH AT S-14-41
CW-244	W	FW	JACKS CREEK AT S-14-76
SC-013	SC	FW	JACKS CREEK AT S-14-76

03050111-040

ST-018	S	FW	TAWCAW CREEK AT S-14-127 3.2 MI S OF SUMMERTON
SC-018	SC	FW	TAWCAW CREEK AT S-14-127 3.2 MI S OF SUMMERTON
SC-017	SC	FW	LAKE MARION, MIDSTREAM OF TAWCAW EMBAYMENT

03050111-050

SC-020	SC	FW	POTATO CREEK AT S-14-127
SC-019	SC	FW	LAKE MARION, MIDSTREAM OF POTATO CREEK EMBAYMENT
ST-024	P	FW	LAKE MARION, POTATO CK ARM AT END OF S-14-64 AT CAMP BOB COOPER
SC-023	SC	FW	LAKE MARION, MIDSTREAM OF WYBOO CREEK EMBAYMENT
SC-050	SC	FW	HEAD OF FURTHEST UPSTREAM (FIRST) LIZZIES BRANCH TRIB
SC-051	SC	FW	MOUTH OF FURTHEST UPSTREAM (FIRST) LIZZIES BRANCH TRIB
SC-052	SC	FW	HEAD OF SECOND LIZZIES BRANCH TRIB
SC-053	SC	FW	MOUTH OF SECOND LIZZIES BRANCH TRIB
SC-054	SC	FW	MIDDLE OF FIRST LIZZIES BRANCH TRIB
SC-055	SC	FW	MOUTH OF LIZZIES BRANCH TRIB
SC-035	SC	FW	MOUTH OF WYBOO SWAMP EMBAYMENT

03050112-010

SC-024	SC	FW	SANTEE RIVER AT WILSONS LANDING
ST-016	P	FW	SANTEE RIVER AT US 52 6.5 MI NNW OF ST STEPHENS

03050112-020

SC-037	SC	FW	REDIVERSION CANAL AT SC 45
ST-031	P	FW	REDIVERSION CANAL AT US 52

03050112-030

ST-001	P	FW	SANTEE RIVER AT SC 41/US 17A NE OF JAMESTOWN

03050112-050

MD-241	P(I)	FW	MECHAW CREEK AT SC ROUTE 45
CSTL-112	W	FW	WAMBAW CREEK AT EXTENSION OF S-10-857 (BRIDGE NEAR BOAT LANDING)

03050112-060

ST-005	S	FW/SA	NORTH SANTEE RIVER AT US 17
ST-006	P	FW/SA	SOUTH SANTEE RIVER AT US 17

Water Quality Trends and Status by Station

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

P = Primary station, sampled monthly all year round
S = Secondary station, sampled monthly May - October
CS = Special station added for the Catawba/Santee basin study
I* = Currently inactive station which had some data within the period reviewed
SC = Station sampled by Santee-Cooper Public Service Authority

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations:

DO	Dissolved Oxygen	NH3	Ammonia
BOD	Five-Day Biochemical Oxygen Demand	CD	Cadmium
pH	pH	CR	Chromium
TP	Total Phosphorus	CU	Copper
TN	Total Nitrogen	PB	Lead
TURB	Turbidity	HG	Mercury
TSS	Total Suspended Solids	NI	Nickel
BACT	Fecal Coliform Bacteria	ZN	Zinc

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January, 1989 and December, 1993
For trends, number of surface samples collected between January, 1980 and December, 1993

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples which contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January, 1989 and December, 1993. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change in concentration per year

Key to Trends:

D Statistically significant decreasing trend in parameter concentration

I Statistically significant increasing trend in parameter concentration

* No statistically significant trend

Blank Insufficient data to test for long term trends

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050111010																				
SC-056	SC	UNNAMED CK FROM GSX	FW	51	3	6	3.93							52	20	38	5.5			
SC-057	SC	UNNAMED CK FROM GSX	FW	51	1	2	4.3							52	3	6	7.3			
SC-058	SC	UNNAMED CK FROM GSX	FW	32	2	6	3.35							33	2	6	7.45			
SC-005	SC	LAKE MARION	FW	41	13	32	2.43							41	3	7	8.37			
SC-003	SC	BROADWATER CK	FW	9	4	44	3.62							8	0	0				
SC-004	SC	SANTEE RVR	FW	45	1	2	4.7							44	0	0				
SC-008	SC	SANTEE RVR	FW	45	2	4	4.55							45	0	0				
SC-009	SC	SPRING GROVE CK	FW	57	1	2	4.3							56	5	9	5.72			
SC-038	SC	LAKE MARION	FW	40	6	15	3.43							41	1	2	8.7			
SC-039	SC	LAKE MARION	FW	41	12	29	2.75							42	2	5	7.5			
SC-010	SC	LAKE MARION	FW	42	3	7	4.3							41	1	2	9.1			
SC-044	SC	LAKE MARION	FW	31	2	6	3.85							31	5	16	9.38			
SC-011	SC	BIG POPLAR CK	FW	56	17	30	3.08							55	0	0				
SC-012	SC	LAKE MARION	FW	44	2	5	4.7							43	0	0				
SC-045	SC	UNNAMED STREAM	FW	15	0	0								15	1	7	5.97			
SC-014	SC	CHAPEL BRANCH	FW	47	0	0								45	10	22	8.78			
ST-025	P	LAKE MARION	FW	62	1	2	2.9	*	123		D	121	-0.16	61	2	3	8.75	D	122	-0.1
SC-015	SC	LAKE MARION	FW	49	1	2	4.1							46	2	4	8.85			
SC-042	SC	LAKE MARION	FW	46	2	4	2.1							45	3	7	8.83			
SC-040	SC	LAKE MARION	FW	42	0	0								38	2	5	8.8			
SC-041	SC	LAKE MARION	FW	38	1	3	3.9							37	2	5	8.9			
SC-016	SC	LAKE MARION	FW	35	0	0								34	1	3	8.9			
SC-036	SC	LAKE MARION	FW	40	1	3	4							39	2	5	8.7			
SC-021	SC	LAKE MARION	FW	37	0	0								35	1	3	8.7			
SC-022	SC	LAKE MARION	FW	37	0	0								35	0	0				
CSTL-079	P	DIVERSION CANAL	FW	57	2	4	4.725	D	122	-0.062	D	121	-0.05	56	0	0		D	117	-0.05
SC-025	SC	DIVERSION CANAL	FW	72	1	1	4.5							69	0	0				
03050111020																				
SC-006	SC	WARLEY CK	FW	57	1	2	4.2							56	0	0				
C-058	S	LAKE INSPIRATION	FW	18	3	17	2.033	D	48	-0.225	*	45		17	2	12	9.6	D	47	-0.188
C-063	S	HALFWAY SWAMP CK	FW	24	0	0		*	54		*	51		24	0	0		*	54	
SC-007	SC	HALFWAY SWAMP CK	FW	55	2	4	4.4							54	0	0				
CW-241	CS	HALFWAY SWAMP CK	FW	11	0	0								11	0	0				
CW-242	CS	TRIB TO HALFWAY SWAMP	FW	7	0	0								7	0	0				

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050111010															
SC-056	SC	UNNAMED CK FROM GSX	FW												
SC-057	SC	UNNAMED CK FROM GSX	FW												
SC-058	SC	UNNAMED CK FROM GSX	FW												
SC-005	SC	LAKE MARION	FW												
SC-003	SC	BROADWATER CK	FW												
SC-004	SC	SANTEE RVR	FW												
SC-008	SC	SANTEE RVR	FW												
SC-009	SC	SPRING GROVE CK	FW												
SC-038	SC	LAKE MARION	FW												
SC-039	SC	LAKE MARION	FW												
SC-010	SC	LAKE MARION	FW												
SC-044	SC	LAKE MARION	FW												
SC-011	SC	BIG POPLAR CK	FW												
SC-012	SC	LAKE MARION	FW												
SC-045	SC	UNNAMED STREAM	FW												
SC-014	SC	CHAPEL BRANCH	FW												
ST-025	P	LAKE MARION	FW	*	118		D	112	-0.019	*	122				
SC-015	SC	LAKE MARION	FW												
SC-042	SC	LAKE MARION	FW												
SC-040	SC	LAKE MARION	FW												
SC-041	SC	LAKE MARION	FW												
SC-016	SC	LAKE MARION	FW												
SC-036	SC	LAKE MARION	FW												
SC-021	SC	LAKE MARION	FW												
SC-022	SC	LAKE MARION	FW												
CSTL-079	P	DIVERSION CANAL	FW	D	117	-0.002	D	111	-0.012	D	120	-0.234			
SC-025	SC	DIVERSION CANAL	FW												
03050111020															
SC-006	SC	WARLEY CK	FW												
C-058	S	LAKE INSPIRATION	FW	*	42					*	44				
C-063	S	HALFWAY SWAMP CK	FW	D	49	-0.005				I	51	0.5			
SC-007	SC	HALFWAY SWAMP CK	FW												
CW-241	CS	HALFWAY SWAMP CK	FW												
CW-242	CS	TRIB TO HALFWAY SWAMP	FW												

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				BACT	BACT	BACT	MEAN	TRENDS			NH3	NH3	CD	CD	CD
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	N	EXC.	MED.
03050111010															
SC-056	SC	UNNAMED CK FROM GSX	FW	1	0	0					55	0			
SC-057	SC	UNNAMED CK FROM GSX	FW	1	0	0					55	0			
SC-058	SC	UNNAMED CK FROM GSX	FW	1	0	0					36	0			
SC-005	SC	LAKE MARION	FW	40	0	0					45	0			
SC-003	SC	BROADWATER CK	FW	7	0	0					9	0			
SC-004	SC	SANTEE RVR	FW	46	4	9	640				48	0			
SC-008	SC	SANTEE RVR	FW	44	1	2	600				48	0			
SC-009	SC	SPRING GROVE CK	FW	59	18	31	537				61	0			
SC-038	SC	LAKE MARION	FW	42	0	0					44	0			
SC-039	SC	LAKE MARION	FW	42	0	0					45	0			
SC-010	SC	LAKE MARION	FW	42	1	2	516				46	0			
SC-044	SC	LAKE MARION	FW	34	0	0					34	0			
SC-011	SC	BIG POPLAR CK	FW	57	1	2	940				59	0			
SC-012	SC	LAKE MARION	FW	45	0	0					48	0			
SC-045	SC	UNNAMED STREAM	FW	15	0	0					16	0			
SC-014	SC	CHAPEL BRANCH	FW	49	0	0					51	0			
ST-025	P	LAKE MARION	FW	60	0	0		*	123		60	0	19	0	
SC-015	SC	LAKE MARION	FW	49	0	0					51	0			
SC-042	SC	LAKE MARION	FW	47	0	0					49	0			
SC-040	SC	LAKE MARION	FW	40	0	0					44	0			
SC-041	SC	LAKE MARION	FW	39	0	0					40	0			
SC-016	SC	LAKE MARION	FW	34	0	0					37	0			
SC-036	SC	LAKE MARION	FW	41	0	0					43	0			
SC-021	SC	LAKE MARION	FW	34	0	0					38	0			
SC-022	SC	LAKE MARION	FW	35	0	0					38	0			
CSTL-079	P	DIVERSION CANAL	FW	56	2	4	1570	*	116		54	0	18	0	DL
SC-025	SC	DIVERSION CANAL	FW	71	1	1	530				76	0			
03050111020															
SC-006	SC	WARLEY CK	FW	57	4	7	552				59	0			
C-058	S	LAKE INSPIRATION	FW	15	2	13	31960	*	44						
C-063	S	HALFWAY SWAMP CK	FW	22	8	36	849	D	50	-27.5	6	0	2	0	DL
SC-007	SC	HALFWAY SWAMP CK	FW	56	12	21	838				59	0			
CW-241	CS	HALFWAY SWAMP CK	FW	11	2	18	1800				11	0	4	0	DL
CW-242	CS	TRIB TO HALFWAY SWAMP	FW	7	2	29	935				7	0	3	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050111010																		
SC-056	SC	UNNAMED CK FROM GSX	FW															
SC-057	SC	UNNAMED CK FROM GSX	FW															
SC-058	SC	UNNAMED CK FROM GSX	FW															
SC-005	SC	LAKE MARION	FW															
SC-003	SC	BROADWATER CK	FW															
SC-004	SC	SANTEE RVR	FW															
SC-008	SC	SANTEE RVR	FW															
SC-009	SC	SPRING GROVE CK	FW															
SC-038	SC	LAKE MARION	FW															
SC-039	SC	LAKE MARION	FW															
SC-010	SC	LAKE MARION	FW															
SC-044	SC	LAKE MARION	FW															
SC-011	SC	BIG POPLAR CK	FW															
SC-012	SC	LAKE MARION	FW															
SC-045	SC	UNNAMED STREAM	FW															
SC-014	SC	CHAPEL BRANCH	FW															
ST-025	P	LAKE MARION	FW	19	1	DL	19	3	19	0	DL	19	0	DL	19	0	19	0
SC-015	SC	LAKE MARION	FW															
SC-042	SC	LAKE MARION	FW															
SC-040	SC	LAKE MARION	FW															
SC-041	SC	LAKE MARION	FW															
SC-016	SC	LAKE MARION	FW															
SC-036	SC	LAKE MARION	FW															
SC-021	SC	LAKE MARION	FW															
SC-022	SC	LAKE MARION	FW															
CSTL-079	P	DIVERSION CANAL	FW	19	0	DL	18	1	18	0	DL	18	0	DL	18	0	18	5
SC-025	SC	DIVERSION CANAL	FW															
03050111020																		
SC-006	SC	WARLEY CK	FW															
C-058	S	LAKE INSPIRATION	FW															
C-063	S	HALFWAY SWAMP CK	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
SC-007	SC	HALFWAY SWAMP CK	FW															
CW-241	CS	HALFWAY SWAMP CK	FW	4	0	DL	4	1	4	0	DL	4	0	DL	4	0	4	0
CW-242	CS	TRIB TO HALFWAY SWAMP	FW	3	0	DL	3	0	3	0	DL	3	0	DL	3	0	3	1

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050111030																				
CW-243	CS	BIG BRANCH	FW	12	5	42	3.9							12	3	25	5.683			
CW-244	CS	JACKS CK	FW	12	0	0								12	1	8	5.7			
SC-013	SC	JACKS CK	FW	57	4	7	3.9							56	1	2	5.9			
03050111040																				
ST-018	S	TAWCAW CK	FW	37	8	22	3.106	*	69		D	68	-0.1	36	0	0		*	67	
SC-018	SC	TAWCAW CK	FW	58	5	9	2.7							57	0	0				
SC-017	SC	LAKE MARION	FW	41	0	0								40	1	3	8.6			
03050111050																				
SC-020	SC	POTATO CK	FW	57	2	4	4.78							56	0	0				
SC-019	SC	LAKE MARION	FW	49	1	2	4.8							49	0	0				
ST-024	P	LAKE MARION	FW	60	1	2	3.75	*	141		D	124	-0.1	59	0	0		D	137	-0.033
SC-023	SC	LAKE MARION	FW	50	0	0								49	0	0				
SC-050	SC	FAR RICKENBAKER CANAL	FW	5	0	0								6	0	0				
SC-051	SC	FAR RICKENBAKER CANAL	FW	5	0	0								6	0	0				
SC-052	SC	2ND RICKENBAKER CANAL	FW	5	0	0								6	0	0				
SC-053	SC	2ND RICKENBAKER CANAL	FW	5	0	0								6	0	0				
SC-054	SC	1ST RICKENBAKER CANAL	FW	5	0	0								6	0	0				
SC-055	SC	LIZZIES BRANCH	FW	5	0	0								6	0	0				
SC-035	SC	LAKE MARION	FW	50	0	0								50	1	2	8.6			
03050112010																				
SC-024	SC	SANTEE RVR	FW	70	1	1	4.7							68	0	0				
ST-016	P	SANTEE RVR	FW	57	7	12	4.243	*	120		D	120	-0.039	56	2	4	5.8	D	116	-0.038
03050112020																				
SC-037	SC	REDIVERSION CANAL	FW	72	1	1	4.9							70	0	0				
ST-031	P	REDIVERSION CANAL	FW	31	0	0		D	31	-0.45	*	31		30	0	0		*	30	
03050112030																				
ST-001	P	SANTEE RVR	FW	56	12	21	3.8	D	135	-0.109	D	119	-0.033	55	3	5	5.917	D	130	-0.036
03050112050																				
MD-241	I*	MECHAW CK	FW	30	12	40	1.954	*	35		*	33		29	12	41	5.579	*	34	
CSTL-112	CS	WAMBAW CK	FW	12	3	25	3.45							12	0	0				
03050112060																				
ST-005	S	N SANTEE RVR	FW	28	3	11	4.4	*	56		*	56		28	1	4	5.5	D	56	-0.05
ST-006	P	S SANTEE RVR	FW	59	5	8	4.244	*	123		D	120	-0.1	58	3	5	5.783	D	119	-0.039

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050111030															
CW-243	CS	BIG BRANCH	FW												
CW-244	CS	JACKS CK	FW												
SC-013	SC	JACKS CK	FW												
03050111040															
ST-018	S	TAWCAW CK	FW	D	67	-0.01				*	67				
SC-018	SC	TAWCAW CK	FW												
SC-017	SC	LAKE MARION	FW												
03050111050															
SC-020	SC	POTATO CK	FW												
SC-019	SC	LAKE MARION	FW												
ST-024	P	LAKE MARION	FW	D	123	-0.001	D	119	-0.015	I	123	0.12			
SC-023	SC	LAKE MARION	FW												
SC-050	SC	FAR RICKENBAKER CANAL	FW												
SC-051	SC	FAR RICKENBAKER CANAL	FW												
SC-052	SC	2ND RICKENBAKER CANAL	FW												
SC-053	SC	2ND RICKENBAKER CANAL	FW												
SC-054	SC	1ST RICKENBAKER CANAL	FW												
SC-055	SC	LIZZIES BRANCH	FW												
SC-035	SC	LAKE MARION	FW												
03050112010															
SC-024	SC	SANTEE RVR	FW												
ST-016	P	SANTEE RVR	FW	D	119	-0.001	D	114	-0.01	*	120				
03050112020															
SC-037	SC	REDIVERSION CANAL	FW												
ST-031	P	REDIVERSION CANAL	FW							*	31				
03050112030															
ST-001	P	SANTEE RVR	FW	D	117	-0.001	*	113		*	118		*	114	
03050112050															
MD-241	I*	MECHAW CK	FW	*	32		*	32		*	33				
CSTL-112	CS	WAMBAW CK	FW												
03050112060															
ST-005	S	N SANTEE RVR	FW	D	53	-0.004				D	56	-1.536			
ST-006	P	S SANTEE RVR	FW	D	116	-0.003	D	111	-0.04	D	121	-1.388			

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				BACT	BACT	BACT	MEAN	TRENDS			NH3	NH3	CD	CD	CD
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	N	EXC.	MED.
03050111030															
CW-243	CS	BIG BRANCH	FW	11	6	55	843				11	0	4	0	DL
CW-244	CS	JACKS CK	FW	12	2	17	600				11	0	4	0	DL
SC-013	SC	JACKS CK	FW	58	9	16	810				61	0			
03050111040															
ST-018	S	TAWCAW CK	FW	37	11	30	1257	*	68		11	0	2	0	DL
SC-018	SC	TAWCAW CK	FW	60	9	15	746				61	0			
SC-017	SC	LAKE MARION	FW	43	0	0					44	0			
03050111050															
SC-020	SC	POTATO CK	FW	60	5	8	778				61	0			
SC-019	SC	LAKE MARION	FW	50	0	0					52	0			
ST-024	P	LAKE MARION	FW	60	0	0		I	126	0.14	58	0	19	0	DL
SC-023	SC	LAKE MARION	FW	51	0	0					54	0			
SC-050	SC	FAR RICKENBAKER CANAL	FW	6	0	0					6	0			
SC-051	SC	FAR RICKENBAKER CANAL	FW	6	0	0					6	0			
SC-052	SC	2ND RICKENBAKER CANAL	FW	6	0	0					6	0			
SC-053	SC	2ND RICKENBAKER CANAL	FW	6	0	0					6	0			
SC-054	SC	1ST RICKENBAKER CANAL	FW	6	0	0					6	0			
SC-055	SC	LIZZIES BRANCH	FW	6	0	0					6	0			
SC-035	SC	LAKE MARION	FW	50	0	0					54	0			
03050112010															
SC-024	SC	SANTEE RVR	FW	70	4	6	619				75	0			
ST-016	P	SANTEE RVR	FW	56	4	7	660	*	115		55	0	19	0	DL
03050112020															
SC-037	SC	REDIVERSION CANAL	FW	71	0	0					76	0			
ST-031	P	REDIVERSION CANAL	FW	31	1	3	490	*	31		30	0	11	0	DL
03050112030															
ST-001	P	SANTEE RVR	FW	55	8	15	1193	I	117	6.17	55	0	18	0	DL
03050112050															
MD-241	I*	MECHAW CK	FW	28	4	14	1337.5	*	30		26	0	8	0	DL
CSTL-112	CS	WAMBAW CK	FW	12	0	0					12	0	4	0	DL
03050112060															
ST-005	S	N SANTEE RVR	FW	28	0	0		*	54		12	0	4	0	DL
ST-006	P	S SANTEE RVR	FW	59	2	3	700	*	119		53	0	18	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0302

STATION				CR	CR	CR	CU	CU	PB	PB	PB	HG	HG	HG	NI	NI	ZN	ZN
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	MED.	N	EXC.	N	EXC.	MED.	N	EXC.	MED.	N	EXC.	N	EXC.
03050111030																		
CW-243	CS	BIG BRANCH	FW	4	0	DL	4	0	3	0	DL	3	0	DL	4	0	4	1
CW-244	CS	JACKS CK	FW	4	1	DL	4	0	4	0	DL	3	0	DL	4	0	4	0
SC-013	SC	JACKS CK	FW															
03050111040																		
ST-018	S	TAWCAW CK	FW	2	0	DL	2	1	2	0	DL	2	0	DL	2	0	2	0
SC-018	SC	TAWCAW CK	FW															
SC-017	SC	LAKE MARION	FW															
03050111050																		
SC-020	SC	POTATO CK	FW															
SC-019	SC	LAKE MARION	FW															
ST-024	P	LAKE MARION	FW	19	0	DL	19	1	19	0	DL	18	0	DL	19	0	19	2
SC-023	SC	LAKE MARION	FW															
SC-050	SC	FAR RICKENBAKER CANAL	FW															
SC-051	SC	FAR RICKENBAKER CANAL	FW															
SC-052	SC	2ND RICKENBAKER CANAL	FW															
SC-053	SC	2ND RICKENBAKER CANAL	FW															
SC-054	SC	1ST RICKENBAKER CANAL	FW															
SC-055	SC	LIZZIES BRANCH	FW															
SC-035	SC	LAKE MARION	FW															
03050112010																		
SC-024	SC	SANTEE RVR	FW															
ST-016	P	SANTEE RVR	FW	19	0	DL	19	2	19	0	DL	19	0	DL	19	0	19	2
03050112020																		
SC-037	SC	REDIVERSION CANAL	FW															
ST-031	P	REDIVERSION CANAL	FW	11	0	DL	11	0	11	0	DL	11	0	DL	11	0	11	0
03050112030																		
ST-001	P	SANTEE RVR	FW	18	0	DL	18	3	18	1	DL	18	0	DL	18	0	18	1
03050112050																		
MD-241	I*	MECHAW CK	FW	8	1	DL	8	3	8	0	DL	8	0	DL	8	0	8	0
CSTL-112	CS	WAMBAW CK	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	0
03050112060																		
ST-005	S	N SANTEE RVR	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	0
ST-006	P	S SANTEE RVR	FW	18	1	DL	18	2	18	0	DL	18	0	DL	18	0	17	1

Mean Seasonal Water Quality Values

CATAWBA-SANTEE WMU-0302

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TEMPERATURE (°C)	Mean	18.5	26.8	17.9	11.4
	Max	31.0	32.0	25.0	18.5
	Min	7.5	16.0	10.0	4.0
	Med	18.0	27.0	17.5	12.0
	95%	25.5	31.0	23.0	16.0
	N	140	212	95	125
DISSOLVED OXYGEN (mg/l)	Mean	7.9	6.3	7.2	9.3
	Max	12.3	12.0	12.3	12.8
	Min	2.3	0.9	0.5	4.2
	Med	7.9	6.4	7.7	9.5
	5%	4.5	3.1	1.4	6.3
	N	140	212	95	126
pH (SU)	Mean	6.8	6.8	6.7	6.7
	Max	9.8	9.4	8.2	8.8
	Min	5.4	4.8	5.1	5.6
	Med	6.8	6.8	6.7	6.7
	95%	7.7	7.7	7.5	7.5
	N	139	212	87	125
BOD_5 (mg/l)	Mean	2.1	2.3	1.8	1.5
	Max	6.5	12.0	8.2	6.2
	Min	0.9	0.3	0.2	0.3
	Med	1.8	1.9	1.6	1.4
	95%	3.8	5.9	3.3	2.5
	N	140	206	84	124

CATAWBA-SANTEE WMU-0302

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TURBIDITY (NTU)	Mean	12.6	10.5	8.5	11.9
	Max	80.0	85.0	28.0	80.0
	Min	1.4	1.2	2.3	0.7
	Med	8.9	8.2	7.4	9.1
	95%	35.0	29.0	17.0	32.0
	N	140	208	84	125
AMMONIA (mg/l)	Mean	0.13	0.18	0.19	0.18
	Max	0.63	3.40	3.00	3.40
	Min	0.05	0.05	0.05	0.05
	Med	0.10	0.11	0.11	0.12
	95%	0.31	0.49	0.30	0.48
	N	172	200	119	174
TKN (mg/l)	Mean	0.52	0.66	0.60	0.51
	Max	1.62	6.20	4.40	4.70
	Min	0.10	0.05	0.09	0.10
	Med	0.44	0.55	0.50	0.44
	95%	1.06	1.24	1.06	0.86
	N	280	430	215	276
NITRITE-NITRATE (mg/l)	Mean	0.32	0.53	0.48	0.33
	Max	4.00	52.00	30.00	2.80
	Min	0.02	0.02	0.02	0.02
	Med	0.22	0.22	0.16	0.24
	95%	1.50	1.80	1.97	0.81
	N	361	597	280	284

CATAWBA-SANTEE WMU-0302

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TOTAL PHOSPHORUS (mg/l)	Mean	0.11	0.16	0.17	0.09
	Max	1.70	4.20	1.70	0.97
	Min	0.02	0.02	0.02	0.02
	Med	0.07	0.07	0.07	0.06
	95%	0.38	0.64	0.86	0.26
	N	356	728	265	240
TOTAL ORGANIC CARBON (mg/l)	Mean	6.1	6.3	6.5	4.9
	Max	14.2	28.0	15.4	11.3
	Min	1.5	1.4	2.8	1.4
	Med	5.9	5.3	5.8	4.4
	95%	10.5	13.0	12.1	8.4
	N	129	159	94	113
FECAL COLIFORM BACTERIA (#/100ml)	Mean	57	93	70	60
	Max	27,000	110,000	32,000	21,000
	Min	1	1	1	1
	Med	75	130	80	66
	95%	3,000	4,000	3,000	2,100
	N	375	778	285	277

APPENDIX C. WMU-0303

Monitoring Station Descriptions

STATION TYPE (P=PRIMARY, S=SECONDARY, W=WATERSHED, SC=SANTEE COOPER, I=INACTIVE)
CLASS (FW=FRESHWATER)

STA.#	TYPE	CLASS	STATION DESCRIPTION
03050201-010			
SC-043	SC	FW	LAKE MOULTRIE TRIB AT SE CORNER OF CROSS GENERATING STA.
SC-026	SC	FW	LAKE MOULTRIE TRIB 0.4 MI UPSTREAM OF SC 6
SC-027	SC	FW	LAKE MOULTRIE IN SW QUADRANT
SC-034	SC	FW	DUCK POND CREEK AT SC 6
SC-028	SC	FW	LAKE MOULTRIE IN NW QUADRANT
SC-029	SC	FW	LAKE MOULTRIE IN SOUTHERN QUADRANT
SC-030	SC	FW	LAKE MOULTRIE MID-POINT AT USFWS CHANNEL MARKER 17
SC-031	SC	FW	LAKE MOULTRIE IN NORTHERN QUADRANT
SC-032	SC	FW	LAKE MOULTRIE IN SE QUADRANT AT USFWS CHANNEL MARKER 2
SC-033	SC	FW	TAILRACE CANAL AT DOCK RESTAURANT BOAT SLIP
CSTL-062	P	FW	TAIL RACE CANAL AT US 52 & 17A BELOW LAKE MOULTRIE
03050201-020			
ST-007	S	FW	WALKER SWAMP AT US 52 2.5 MI S ST STEPHENS
CSTL-113	W	FW	WADBOO CREEK AT SC 402
03050201-030			
CSTL-085	S	FW	PIER IN WEST BRANCH COOPER RIVER AT END OF RICE MILL RD IN PIMLICO
MD-217	P	FW	DURHAM CREEK AT S-08-9 BRIDGE
03050201-050			
MD-152	P	FW/SB	COOPER RIVER AT S-08-503 6.2 MI ESE TOWN OF GOOSE CREEK
MD-043	P	SB	COOPER RIVER AT CHANNEL MARKER 72 NEAR USN AMMO DEPOT
MD-044	P	SB	COOPER RIVER BELOW MOUTH OF GOOSE CREEK AT CHANNEL BUOY 60
MD-249	P	SB	FILBIN CREEK AT VIRGINIA AVE, NORTH CHARLESTON
MD-248	P	SB	COOPER RIVER AT MARK CLARK BRIDGE (I-526)
MD-045	P	SB	COOPER RIVER UPSTREAM OF SHIPYARD CREEK AT CHANNEL BUOY 49
MD-243	P	SB	SHIPYARD CREEK BETWEEN MARKER #6 AND MCALLOY DOCK
MD-047	P	SB	TOWN CREEK (W SIDE OF DRUM ISL) UNDER GRACE MEMORIAL BRIDGE
MD-046	P	SB	COOPER RIVER UNDER GRACE MEMORIAL BRIDGE
03050201-060			
MD-240	P	FW	FOSTER CREEK AT CHARLESTON CPW WATER INTAKE
03050201-070			
MD-114	P	FW	GOOSE CREEK AT US 52 N CHTN
ST-033	W	FW	GOOSE CREEK RESERVOIR AT 2ND POWERLINES UPSTREAM OF BOAT RAMP
MD-113	P	FW	GOOSE CREEK RESERVOIR AT CHTN WTR INTAKE
ST-032	P	FW	GOOSE CREEK RESERVOIR 100 M UPSTREAM OF DAM
MD-039	P	SB	GOOSE CREEK AT S-08-136 BRIDGE

03050201-080

CSTL-114	W	SA	IRON SWAMP TRIB AT US 17
MD-115	P	SFH	WANDO RIVER [illegible] SC 41
MD-198	P	SFH	WANDO RIVER BETW RATHALL & HO[illegible]AW CKS

03050202-010

CSTL-063	P	FW	WASSAMASSAW SWAMP AT US 176
CSTL-078	W	FW	CYPRESS SWAMP AT US 78

03050202-020

CSTL-102	P	FW/SA	ASHLEY RIVER AT SC 165 4.8 MI SSW OF SUMMERVILLE

03050202-030

CSTL-043	S	FW	SAWMILL BRANCH AT SC 78 E OF SUMMERVILLE
CSTL-013	P	SA	DORCHESTER CREEK AT SC 165
CSTL-099	P	SB	EAGLE CREEK AT SC 642 5 MI SSE OF SUMMERVILLE

03050202-040

MD-049	P	SA	ASHLEY RIVER AT MAGNOLIA GARDENS
MD-246	P	SA*	CHURCH CREEK MOUTH
MD-242	S(I)	SA*	ASHLEY R., BETW LEEDS AVE BOAT RAMP AND MOUTH OF CHURCH CK
MD-135	S	SA*	ASHLEY RIVER AT SC 7 (NORTH BRIDGE)
MD-052	P	SA	ASHLEY RIVER AT SAL RR BRIDGE

03050202-050

MD-121	S	SFH	LOG BRIDGE CREEK AT SC 162
MD-202	P	ORW	STONO RIVER AT S-10-20 2 MI UPSTREAM OF CLEMSON EXPERIMENT STATION
MD-025	S	SFH	MOUTH OF ELLIOTT CUT AT EDGE WATER DR (S-10-26 OFF HW 17)
MD-020	P	SB	MOUTH OF WAPPOO CREEK BETW CHANNEL MARKERS 3 & 4

03050202-060

MD-250	W	SFH	AWENDAW CREEK AT US 17
MD-203	P	SFH	JEREMY CREEK NEAR BOAT LANDING AT MCCLELLANVILLE TOWN HALL
MD-069	P	SB/SFH	INTRACOASTAL WATERWAY AT SC 703 E MOUNT PLEASANT

03050202-070

MD-034	P	SA	RT BK OF ASHLEY RIVER BTWN MOUTH OF JAMES IS. CREEK & DILL CREEK
MD-165	P	SB	CHARLESTON HARBOR AT FT JOHNSON PIER AT MARINE SCI LAB
MD-048	P	SB	S.CHANNEL CHAS HARBOR OFF FT JOHNSON QUARAN.STA BELL BUOY 28
MD-247	P	SB	CHARLESTON HARBOR IN VICINITY OF MT. PLEASANT WWTP DIFFUSER
MD-070	P(I)	SB	ABANDONED BRIDGE OVER THE COVE END OF PITT STREET IN MT.PLEASANT
MD-071	P	SB	SHEM CREEK AT BRIDGE ON US 17
MD-026	P	SFH	STONO RIVER AT SC 700
MD-206	S	SFH	STONO RIVER AT ABBAPOOLA CREEK
MD-207	S	SFH	KIAWAH RIVER MOUTH AT STONO [illegible]IVER
MD-208	S	SFH	STONO RIVER MOUTH AT BUOY 10 OFF SANDY POINT

Water Quality Trends and Status by Station

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

- P = Primary station, sampled monthly all year round
- S = Secondary station, sampled monthly May - October
- CS = Special station added for the Catawba/Santee basin study
- I* = Currently inactive station which had some data within the period reviewed
- SC = Station sampled by Santee-Cooper Public Service Authority

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations:

DO	Dissolved Oxygen	NH3	Ammonia
BOD	Five-Day Biochemical Oxygen Demand	CD	Cadmium
pH	pH	CR	Chromium
TP	Total Phosphorus	CU	Copper
TN	Total Nitrogen	PB	Lead
TURB	Turbidity	HG	Mercury
TSS	Total Suspended Solids	NI	Nickel
BACT	Fecal Coliform Bacteria	ZN	Zinc

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January, 1989 and December, 1993
For trends, number of surface samples collected between January, 1980 and December, 1993

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples which contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January, 1989 and December, 1993. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change in concentration per year

Key to Trends:

D Statistically significant decreasing trend in parameter concentration

I Statistically significant increasing trend in parameter concentration

* No statistically significant trend

Blank Insufficient data to test for long term trends

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050201010																				
SC-043	SC	UNNAMED TRIB	FW	48	7	15	3.07							47	0	0				
SC-026	SC	UNNAMED TRIB	FW	27	1	4	3.8							26	0	0				
SC-027	SC	LAKE MOULTRIE	FW	29	0	0								30	2	7	8.65			
SC-034	SC	DUCK POND CK	FW	14	2	14	2.25							13	5	38	5.42			
SC-028	SC	LAKE MOULTRIE	FW	29	0	0								30	1	3	9			
SC-029	SC	LAKE MOULTRIE	FW	27	0	0								29	1	3	8.8			
SC-030	SC	LAKE MOULTRIE	FW	31	0	0								31	0	0				
SC-031	SC	LAKE MOULTRIE	FW	29	0	0								30	1	3	8.7			
SC-032	SC	LAKE MOULTRIE	FW	31	0	0								31	1	3	8.6			
SC-033	SC	TAIL RACE, LK MOULTRIE	FW	71	0	0								71	0	0				
CSTL-062	P	TAIL RACE, LK MOULTRIE	FW	60	2	3	4.425	D	124	-0.053	D	123	-0.05	57	0	0		D	117	-0.025
03050201020																				
ST-007	S	WALKER SWAMP	FW	19	2	11	3.85	*	49		D	50	-0.115	20	1	5	5.8	*	50	
CSTL-113	CS	WADBOO SWAMP	FW	12	4	33	3.938							12	0	0				
03050201030																				
CSTL-085	S	COOPER RVR	FW	29	1	3	4.5	*	57		*	54		29	1	3	8.55	D	56	-0.038
MD-217	P	DURHAM CK	FW	59	7	12	3.679	*	99		D	97	-0.067	59	3	5	6.85	*	99	
03050201050																				
MD-152	P	COOPER RVR	FW	59	8	14	4.512	D	147	-0.125	*	125		58	1	2	5.9	D	143	-0.067
MD-043	P	COOPER RVR	SB	56	0	0		D	145	-0.1	*	128		54	1	2	6.35	D	141	-0.044
MD-044	P	COOPER RVR	SB	69	1	1	3.5	D	156	-0.1	*	130		68	2	3	7.5	D	152	-0.035
MD-249	P	FILBIN CK	SB	8	2	25	3.575							8	0	0				
MD-248	P	COOPER RVR	SB	8	0	0								7	0	0				
MD-045	P	COOPER RVR	SB	65	2	3	3.6	D	167	-0.1	*	134		63	1	2	6.35	D	153	-0.013
MD-243	P	SHIPYARD CK	SB	49	0	0		I	48	0.225	*	42		47	2	4	7.45	*	46	
MD-047	P	TOWN CK, COOPER RVR	SB	67	0	0		D	156	-0.075	*	132		64	0	0		*	150	
MD-046	P	COOPER RVR	SB	62	0	0		D	163	-0.067	*	130		61	2	3	6.15	*	150	
03050201060																				
MD-240	P	FOSTER CK	FW	61	44	72	2.346	*	62		*	59		61	5	8	5.03	I	62	0.05
03050201070																				
MD-114	P	GOOSE CK	FW	49	47	96	1.521	*	109		*	95		48	7	15	5.65	*	107	
ST-033	CS	GOOSE CK RESERVOIR	FW	10	2	20	3.175							10	3	30	7.953			
MD-113	P	GOOSE CK RESERVOIR	FW	61	38	62	2.203	D	122	-0.15	*	118		60	5	8	6.56	D	119	-0.03
ST-032	P	GOOSE CK RESERVOIR	FW	33	10	30	3.804							32	3	9	8.917			
MD-039	P	GOOSE CK	SB	34	2	6	3.45	*	63		D	61	-0.15	35	3	9	7.083	D	64	-0.038

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050201010															
SC-043	SC	UNNAMED TRIB	FW												
SC-026	SC	UNNAMED TRIB	FW												
SC-027	SC	LAKE MOULTRIE	FW												
SC-034	SC	DUCK POND CK	FW												
SC-028	SC	LAKE MOULTRIE	FW												
SC-029	SC	LAKE MOULTRIE	FW												
SC-030	SC	LAKE MOULTRIE	FW												
SC-031	SC	LAKE MOULTRIE	FW												
SC-032	SC	LAKE MOULTRIE	FW												
SC-033	SC	TAIL RACE, LK MOULTRIE	FW												
CSTL-062	P	TAIL RACE, LK MOULTRIE	FW	D	121	-0.002	D	117	-0.015	D	123	-0.163			
03050201020															
ST-007	S	WALKER SWAMP	FW	*	47					I	50	0.538			
CSTL-113	CS	WADBOO SWAMP	FW												
03050201030															
CSTL-085	S	COOPER RVR	FW	D	52	0				*	56				
MD-217	P	DURHAM CK	FW	D	95	-0.001	D	93	-0.04	*	98				
03050201050															
MD-152	P	COOPER RVR	FW	D	123	-0.001	D	120	-0.023	I	129	0.244			
MD-043	P	COOPER RVR	SB	D	120	-0.001	D	116	-0.023	I	128	0.171			
MD-044	P	COOPER RVR	SB	D	135	-0.002	D	129	-0.03	*	129				
MD-249	P	FILBIN CK	SB												
MD-248	P	COOPER RVR	SB												
MD-045	P	COOPER RVR	SB	D	144	-0.002	D	136	-0.035	*	142				
MD-243	P	SHIPYARD CK	SB	*	39		*	38		*	42				
MD-047	P	TOWN CK, COOPER RVR	SB	D	136	-0.003	D	132	-0.03	I	131	0.138			
MD-046	P	COOPER RVR	SB	D	142	-0.003	D	133	-0.018	I	139	0.125			
03050201060															
MD-240	P	FOSTER CK	FW	*	57		*	56		*	61				
03050201070															
MD-114	P	GOOSE CK	FW	D	103	-0.012	D	101	-0.027	*	105				
ST-033	CS	GOOSE CK RESERVOIR	FW												
MD-113	P	GOOSE CK RESERVOIR	FW	D	110	-0.007	*	110		*	118				
ST-032	P	GOOSE CK RESERVOIR	FW												
MD-039	P	GOOSE CK	SB	D	61	-0.02				*	63				

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.
03050201010															
SC-043	SC	UNNAMED TRIB	FW	48	7	15	581				49	0			
SC-026	SC	UNNAMED TRIB	FW	28	8	29	710				28	0			
SC-027	SC	LAKE MOULTRIE	FW	29	0	0					35	0			
SC-034	SC	DUCK POND CK	FW	15	2	13	1225				14	0			
SC-028	SC	LAKE MOULTRIE	FW	31	0	0					33	0			
SC-029	SC	LAKE MOULTRIE	FW	30	0	0					33	0			
SC-030	SC	LAKE MOULTRIE	FW	31	0	0					34	0			
SC-031	SC	LAKE MOULTRIE	FW	29	0	0					32	0			
SC-032	SC	LAKE MOULTRIE	FW	31	0	0					34	0			
SC-033	SC	TAIL RACE, LK MOULTRIE	FW	71	3	4	507				76	0			
CSTL-062	P	TAIL RACE, LK MOULTRIE	FW	60	3	5	543	*	123		58	0	22	0	DL
03050201020															
ST-007	S	WALKER SWAMP	FW	19	10	53	2315	*	45				3	0	DL
CSTL-113	CS	WADBOO SWAMP	FW	12	3	25	1170				12	0	4	0	DL
03050201030															
CSTL-085	S	COOPER RVR	FW	28	1	4	600	*	55		12	0	7	0	DL
MD-217	P	DURHAM CK	FW	60	3	5	1000	*	99		55	0	20	0	DL
03050201050															
MD-152	P	COOPER RVR	FW	53	0	0		I	132	1.11	51	0	20	0	DL
MD-043	P	COOPER RVR	SB	53	1	2	900	I	129	1	51	0	20	0	DL
MD-044	P	COOPER RVR	SB	54	2	4	520	I	132	1.67	51	0	20	0	DL
MD-249	P	FILBIN CK	SB	8	7	88	1353				8	0	2	0	DL
MD-248	P	COOPER RVR	SB	9	3	27	1367				8	0	2	0	DL
MD-045	P	COOPER RVR	SB	53	6	11	767	*	141		61	0	19	0	DL
MD-243	P	SHIPYARD CK	SB	43	2	5	1013	*	42		39	0	14	0	DL
MD-047	P	TOWN CK, COOPER RVR	SB	54	9	17	1389	*	130		63	0	20	0	DL
MD-046	P	COOPER RVR	SB	52	4	8	1000	*	138		59	0	20	0	DL
03050201060															
MD-240	P	FOSTER CK	FW	61	18	30	2494	*	59		56	0	19	0	DL
03050201070															
MD-114	P	GOOSE CK	FW	41	9	22	1187	*	99		47	0	16	0	DL
ST-033	CS	GOOSE CK RESERVOIR	FW	6	0	0					10	0	2	0	DL
MD-113	P	GOOSE CK RESERVOIR	FW	61	6	10	1540	*	121		57	0	19	0	DL
ST-032	P	GOOSE CK RESERVOIR	FW	9	0	0					22	0	2	0	DL
MD-039	P	GOOSE CK	SB	35	29	83	1555	*	62		19	0	5	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050201010																		
SC-043	SC	UNNAMED TRIB	FW															
SC-026	SC	UNNAMED TRIB	FW															
SC-027	SC	LAKE MOULTRIE	FW															
SC-034	SC	DUCK POND CK	FW															
SC-028	SC	LAKE MOULTRIE	FW															
SC-029	SC	LAKE MOULTRIE	FW															
SC-030	SC	LAKE MOULTRIE	FW															
SC-031	SC	LAKE MOULTRIE	FW															
SC-032	SC	LAKE MOULTRIE	FW															
SC-033	SC	TAIL RACE, LK MOULTRIE	FW															
CSTL-062	P	TAIL RACE, LK MOULTRIE	FW	22	0	DL	22	4	22	0	DL	21	0	DL	22	0	22	3
03050201020																		
ST-007	S	WALKER SWAMP	FW	3	0	DL	3	0	3	0	DL	3	0	DL	3	0	3	0
CSTL-113	CS	WADBOO SWAMP	FW	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	0
03050201030																		
CSTL-085	S	COOPER RVR	FW	7	0	DL	7	1	7	0	DL	7	0	DL	7	0	7	0
MD-217	P	DURHAM CK	FW	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	0
03050201050																		
MD-152	P	COOPER RVR	FW	20	0	DL	20	0	20	0	DL	20	0	DL	20	0	20	1
MD-043	P	COOPER RVR	SB	20	0	DL	20	0	20	0	DL	20	0	DL	20	0	20	0
MD-044	P	COOPER RVR	SB	20	0	DL	20	1	20	0	DL	20	0	DL	20	0	20	0
MD-249	P	FILBIN CK	SB	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
MD-248	P	COOPER RVR	SB	2	0	DL	2	1	2	0	DL	2	0	DL	2	0	2	0
MD-045	P	COOPER RVR	SB	19	0	DL	19	1	18	0	DL	19	0	DL	19	0	19	0
MD-243	P	SHIPYARD CK	SB	15	0	DL	15	0	14	0	DL	15	0	DL	15	0	15	0
MD-047	P	TOWN CK, COOPER RVR	SB	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	0
MD-046	P	COOPER RVR	SB	20	0	DL	20	1	20	0	DL	20	0	DL	20	0	20	0
03050201060																		
MD-240	P	FOSTER CK	FW	19	0	DL	19	3	19	0	DL	19	0	DL	19	0	19	0
03050201070																		
MD-114	P	GOOSE CK	FW	16	1	DL	16	2	16	1	DL	16	0	DL	16	0	16	2
ST-033	CS	GOOSE CK RESERVOIR	FW	2	0	DL	2	1	2	0	DL	2	0	DL	2	0	2	0
MD-113	P	GOOSE CK RESERVOIR	FW	19	0	DL	19	2	19	0	DL	19	0	DL	19	0	19	2
ST-032	P	GOOSE CK RESERVOIR	FW	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
MD-039	P	GOOSE CK	SB	5	0	DL	5	0	5	0	DL	5	0	DL	5	0	5	1

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050201080																				
CSTL-114	CS	IRON SWAMP TRIB	SA	2	0	0								2	0	0				
MD-115	P	WANDO RVR	SFH	68	18	26	4.173	D	148	-0.115	D	125	-0.067	68	1	1	6	D	130	-0.017
MD-198	P	WANDO RVR	SFH	53	12	23	4.412	D	155	-0.057	*	131		50	1	2	6.4	*	140	
03050202010																				
CSTL-063	P	WASSAMASSAW SWAMP	FW	57	25	44	3.722	*	120		D	119	-0.083	56	4	7	5.875	*	118	
CSTL-078	CS	CYPRESS SWAMP	FW	12	7	58	1.586							12	0	0				
03050202020																				
CSTL-102	P	ASHLEY RVR	FW	39	16	41	3.603	*	79		I	76	0.1	38	2	5	5.475	*	77	
03050202030																				
CSTL-043	S	SAWMILL BRANCH	FW	21	8	38	3.419	*	50		D	49	-0.2	21	1	5	5.75	D	50	-0.075
CSTL-013	P	DORCHESTER CK	SA	34	5	15	3.37	*	63		D	60	-0.167	34	4	12	6.737	*	63	
CSTL-099	P	EAGLE CK	SB	37	0	0		*	75		*	73		37	4	11	7.387	*	74	
03050202040																				
MD-049	P	ASHLEY RVR	SA	60	24	40	3.679	D	132	-0.056	*	127		58	3	5	6.083	D	126	-0.017
MD-246	P	CHURCH CK	SA*	20	2	10	3.65							21	1	5	6.45			
MD-242	I*	ASHLEY RVR	SA*	11	4	36	3.612							12	0	0				
MD-135	S	ASHLEY RVR	SA*	33	12	36	2.7	D	76	-0.1	*	59		30	0	0		*	72	
MD-052	P	ASHLEY RVR	SA	57	16	28	3.934	D	157	-0.05	*	138		56	3	6	7.167	*	150	
03050202050																				
MD-121	S	LOG BRIDGE CK	SFH	11	8	73	4.081							11	2	18	6.075			
MD-202	P	STONO RVR	SFH	58	19	33	3.57	D	135	-0.144	*	124		58	3	5	6.35	D	131	-0.025
MD-025	S	ELLIOTT CUT	SFH	21	9	43	3.933	*	66		*	56		21	0	0		D	65	-0.023
MD-020	P	WAPPOO CK	SB	60	3	5	3.833	D	154	-0.058	*	138		55	0	0		*	146	
03050202060																				
MD-069	P	ICWW	SB	57	0	0		D	146	-0.05	*	134		54	0	0		*	139	
MD-250	CS	AWENDAW CK	SFH	6	1	17	4.9							6	1	17	2.4			
MD-203	P	JEREMY CK	SFH	30	7	23	4.379							30	1	3	3.6			

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050201080															
CSTL-114	CS	IRON SWAMP TRIB	SA												
MD-115	P	WANDO RVR	SFH	D	141	-0.003	D	134	-0.027	*	135				
MD-198	P	WANDO RVR	SFH	D	135	-0.003	D	123	-0.03	*	141				
03050202010															
CSTL-063	P	WASSAMASSAW SWAMP	FW	*	114		*	112		I	120	1			
CSTL-078	CS	CYPRESS SWAMP	FW												
03050202020															
CSTL-102	P	ASHLEY RVR	FW	*	74		*	30		I	78	0.743			
03050202030															
CSTL-043	S	SAWMILL BRANCH	FW	D	46	-0.317				D	50	-2.129			
CSTL-013	P	DORCHESTER CK	SA	D	61	-0.082				*	63				
CSTL-099	P	EAGLE CK	SB	*	69		*	31		*	75				
03050202040															
MD-049	P	ASHLEY RVR	SA	*	122		*	120		*	128				
MD-246	P	CHURCH CK	SA*												
MD-242	I*	ASHLEY RVR	SA*												
MD-135	S	ASHLEY RVR	SA*	*	69					I	61	0.767			
MD-052	P	ASHLEY RVR	SA	D	133	-0.006	D	127	-0.029	I	138	0.283			
03050202050															
MD-121	S	LOG BRIDGE CK	SFH												
MD-202	P	STONO RVR	SFH	D	117	-0.003	*	110		I	123	0.25			
MD-025	S	ELLIOTT CUT	SFH	*	51					*	56				
MD-020	P	WAPPOO CK	SB	D	131	-0.002	D	123	-0.02	*	136				
03050202060															
MD-069	P	ICWW	SB	D	125	-0.003	D	116	-0.015	I	131	0.196			
MD-250	CS	AWENDAW CK	SFH												
MD-203	P	JEREMY CK	SFH												

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				BACT	BACT	BACT	MEAN	TRENDS			NH3	NH3	CD	CD	CD
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	N	EXC.	MED.
03050201080															
CSTL-114	CS	IRON SWAMP TRIB	SA	2	0	0					2	0			
MD-115	P	WANDO RVR	SFH	55	1	2	1600	*	130		66	0	19	1	DL
MD-198	P	WANDO RVR	SFH	52	2	4	1350	I	139	1.31	51	0	20	0	DL
03050202010															
CSTL-063	P	WASSAMASSAW SWAMP	FW	56	6	11	1288	*	116		55	0	20	0	DL
CSTL-078	CS	CYPRESS SWAMP	FW	12	1	8	690				11	0	3	0	DL
03050202020															
CSTL-102	P	ASHLEY RVR	FW	39	10	26	654	*	74		20	0	6	0	DL
03050202030															
CSTL-043	S	SAWMILL BRANCH	FW	21	8	38	1156	D	46	-50					
CSTL-013	P	DORCHESTER CK	SA	34	9	26	1032	D	60	-70.5	19	0	10	0	DL
CSTL-099	P	EAGLE CK	SB	37	25	68	1200	D	73	-57.5	21	0	6	0	DL
03050202040															
MD-049	P	ASHLEY RVR	SA	59	22	37	1444	I	128	11.8	57	0	20	0	DL
MD-246	P	CHURCH CK	SA*	20	6	30	1000				19	0	6	0	DL
MD-242	I*	ASHLEY RVR	SA*	11	3	27	867				2	0			
MD-135	S	ASHLEY RVR	SA*	23	4	17	1600	*	64		17	0	2	0	DL
MD-052	P	ASHLEY RVR	SA	54	12	22	837	*	142		52	0	20	0	DL
03050202050															
MD-121	S	LOG BRIDGE CK	SFH	9	5	56	880				1	0			
MD-202	P	STONO RVR	SFH	57	5	9	1080	*	127		52	0	20	0	DL
MD-025	S	ELLIOTT CUT	SFH	20	7	35	1186	*	57						
MD-020	P	WAPPOO CK	SB	57	5	9	940	*	140		55	0	20	0	DL
03050202060															
MD-069	P	ICWW	SB	56	2	4	900	*	134		52	0	20	0	DL
MD-250	CS	AWENDAW CK	SFH	6	2	33	650				6	0	2	0	DL
MD-203	P	JEREMY CK	SFH	30	4	13	1050				28	0	9	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050201080																		
CSTL-114	CS	IRON SWAMP TRIB	SA															
MD-115	P	WANDO RVR	SFH	19	0	DL	19	3	19	0	DL	18	0	DL	19	0	19	1
MD-198	P	WANDO RVR	SFH	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	0
03050202010																		
CSTL-063	P	WASSAMASSAW SWAMP	FW	20	0	DL	20	4	20	0	DL	18	0	DL	20	0	21	1
CSTL-078	CS	CYPRESS SWAMP	FW	3	0	DL	3	0	3	0	DL	3	0	DL	3	0	3	2
03050202020																		
CSTL-102	P	ASHLEY RVR	FW	6	0	DL	5	0	6	0	DL	6	0	DL	6	0	6	0
03050202030																		
CSTL-043	S	SAWMILL BRANCH	FW															
CSTL-013	P	DORCHESTER CK	SA	10	0	DL	10	2	10	0	DL	10	0	DL	10	0	10	1
CSTL-099	P	EAGLE CK	SB	6	0	DL	6	0	6	0	DL	6	0	DL	6	0	6	0
03050202040																		
MD-049	P	ASHLEY RVR	SA	20	0	DL	20	1	20	0	DL	19	0	DL	20	0	20	0
MD-246	P	CHURCH CK	SA*	6	0	DL	6	0	5	0	DL	6	0	DL	6	0	6	0
MD-242	I*	ASHLEY RVR	SA*															
MD-135	S	ASHLEY RVR	SA*	2	0	DL	2	0	1	0	DL	2	0	DL	2	0	2	0
MD-052	P	ASHLEY RVR	SA	20	0	DL	20	1	19	0	DL	20	0	DL	19	0	20	0
03050202050																		
MD-121	S	LOG BRIDGE CK	SFH															
MD-202	P	STONO RVR	SFH	20	0	DL	20	1	20	0	DL	20	0	DL	20	0	20	2
MD-025	S	ELLIOTT CUT	SFH															
MD-020	P	WAPPOO CK	SB	20	0	DL	20	1	19	0	DL	20	0	DL	20	0	20	0
03050202060																		
MD-069	P	ICWW	SB	20	0	DL	20	2	20	0	DL	20	0	DL	20	0	20	0
MD-250	CS	AWENDAW CK	SFH	2	0	DL	2	0	2	0	DL	2	0	DL	2	0	2	0
MD-203	P	JEREMY CK	SFH	9	0	DL	9	0	9	0	DL	9	0	DL	9	0	9	0

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				DO	DO	DO	MEAN	TRENDS						pH	pH	pH	MEAN	TRENDS		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG	N	EXC.	%	EXC.	PH	N	MAG
03050202070																				
MD-034	P	ASHLEY RVR		65	11	17	4.445	D	156	-0.05	*	136		60	0	0		*	148	
MD-165	P	CHARLESTON HARBOR	SB	58	0	0		D	147	-0.04	*	134		57	1	2	6.4	*	143	
MD-048	P	CHARLESTON HARBOR	SB	64	0	0		D	169	-0.075	D	134	-0.02	60	0	0		I	160	0.01
MD-247	P	CHARLESTON HARBOR	SB	30	0	0		*	30					31	0	0		I	31	0.2
MD-070	I*	THE COVE	SB	46	1	2	3.35	D	133	-0.038	*	112		44	0	0		*	129	
MD-071	P	SHEM CK	SB	66	12	18	3.021	*	150		*	129		64	0	0		*	147	
MD-026	P	STONO RVR	SFH	60	12	20	3.819	D	136	-0.131	D	123	-0.05	58	1	2	6.45	D	130	-0.02
MD-206	S	STONO RVR	SFH	23	8	35	4.406	D	71	-0.063	*	55		21	0	0		*	69	
MD-207	S	KIAWAH RVR	SFH	22	7	32	4.486	D	72	-0.122	*	56		20	1	5	8.8	*	70	
MD-208	S	STONO RVR	SFH	28	1	4	4.9	D	79	-0.1	*	58		26	1	4	9	*	75	

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION				TRENDS											
NUMBER	TYPE	WATERBODY NAME	CLASS	TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050202070															
MD-034	P	ASHLEY RVR	SA	D	137	-0.002	D	131	-0.028	I	134	0.243			
MD-165	P	CHARLESTON HARBOR	SB	D	128	-0.003	D	123	-0.018	I	131	0.194			
MD-048	P	CHARLESTON HARBOR	SB	D	136	-0.005	D	126	-0.018	I	131	0.157	*	107	
MD-247	P	CHARLESTON HARBOR	SB												
MD-070	I*	THE COVE	SB	D	118	-0.005	D	111	-0.022	*	110				
MD-071	P	SHEM CK	SB	D	131	-0.005	D	127	-0.026	I	128	0.23			
MD-026	P	STONO RVR	SFH	D	116	-0.004	D	108	-0.027	*	122				
MD-206	S	STONO RVR	SFH	D	51	-0.003				*	56				
MD-207	S	KIAWAH RVR	SFH	D	55	-0.004				*	57				
MD-208	S	STONO RVR	SFH	D	57	-0.001				*	60				

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.
03050202070															
MD-034	P	ASHLEY RVR	SA	56	6	11	1117	*	134		64	0	20	0	DL
MD-165	P	CHARLESTON HARBOR	SB	56	4	7	775	*	133		54	0	20	0	DL
MD-048	P	CHARLESTON HARBOR	SB	54	1	2	500	D	133	-2	61	0	19	0	DL
MD-247	P	CHARLESTON HARBOR	SB	20	2	10	1050				28	0	5	0	DL
MD-070	I*	THE COVE	SB	36	1	3	800	*	113		43	0	13	1	DL
MD-071	P	SHEM CK	SB	54	9	17	1189	*	129		61	0	20	0	DL
MD-026	P	STONO RVR	SFH	59	4	7	1200	*	126		57	0	20	0	DL
MD-206	S	STONO RVR	SFH	21	0	0		*	62						
MD-207	S	KIAWAH RVR	SFH	21	0	0		*	62						
MD-208	S	STONO RVR	SFH	26	0	0		*	65		11	0	4	0	DL

WATER QUALITY SUMMARY - WATERSHED MANAGEMENT UNIT 0303

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CU N	CU EXC.	PB N	PB EXC.	PB MED.	HG N	HG EXC.	HG MED.	NI N	NI EXC.	ZN N	ZN EXC.
03050202070																		
MD-034	P	ASHLEY RVR	SA	20	0	DL	20	2	19	0	DL	20	0	DL	20	0	20	0
MD-165	P	CHARLESTON HARBOR	SB	20	0	DL	20	2	19	0	DL	19	0	DL	20	0	20	0
MD-048	P	CHARLESTON HARBOR	SB	19	0	DL	19	4	18	0	DL	20	0	DL	19	0	18	1
MD-247	P	CHARLESTON HARBOR	SB	5	0	DL	5	0	5	0	DL	5	0	DL	5	0	5	0
MD-070	I*	THE COVE	SB	13	0	DL	13	1	13	0	DL	13	0	DL	13	0	13	0
MD-071	P	SHEM CK	SB	20	0	DL	20	1	20	0	DL	20	0	DL	20	0	20	0
MD-026	P	STONO RVR	SFH	20	0	DL	20	3	20	0	DL	20	0	DL	20	0	20	1
MD-206	S	STONO RVR	SFH															
MD-207	S	KIAWAH RVR	SFH															
MD-208	S	STONO RVR	SFH	4	0	DL	4	0	4	0	DL	4	0	DL	4	0	4	1

Mean Seasonal Water Quality Values

CATAWBA-SANTEE WMU-0303

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TEMPERATURE (°C)	Mean	19.9	27.9	19.5	11.7
	Max	34.0	33.0	27.0	30.0
	Min	9.0	4.7	10.0	4.0
	Med	20.5	28.0	20.0	12.0
	95%	26.0	31.0	25.0	15.3
	N	539	800	354	412
DISSOLVED OXYGEN (mg/l)	Mean	6.7	5.0	5.6	8.4
	Max	12.3	27.7	14.0	13.0
	Min	0.3	0.2	0.2	1.1
	Med	6.8	4.9	5.9	8.5
	5%	3.9	1.9	0.8	5.1
	N	535	792	341	411
pH (SU)	Mean	7.4	7.2	7.3	7.4
	Max	9.0	9.4	8.7	10.4
	Min	5.8	1.7	4.6	5.9
	Med	7.5	7.3	7.4	7.5
	95%	8.1	8.0	8.1	8.1
	N	535	781	302	403
BOD_5 (mg/l)	Mean	2.0	2.4	2.0	1.5
	Max	16.0	42.0	39.0	7.3
	Min	0.4	0.6	0.4	0.6
	Med	1.6	2.0	1.4	1.4
	95%	3.6	5.5	5.2	2.8
	N	448	706	278	390

CATAWBA-SANTEE WMU-0303

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TURBIDITY (NTU)	Mean	11.2	13.1	10.8	10.0
	Max	180.0	190.0	216.0	110.0
	Min	1.8	1.2	1.4	1.1
	Med	7.4	8.3	7.0	7.3
	95%	32.0	36.0	27.0	26.0
	N	465	709	288	394
AMMONIA (mg/l)	Mean	0.14	0.12	0.15	0.16
	Max	1.27	3.38	0.50	0.80
	Min	0.05	0.05	0.05	0.05
	Med	0.12	0.08	0.13	0.14
	95%	0.23	0.19	0.27	0.31
	N	206	198	103	173
TKN (mg/l)	Mean	0.68	0.76	0.87	0.58
	Max	41.00	18.90	40.00	4.00
	Min	0.10	0.04	0.16	0.10
	Med	0.56	0.61	0.54	0.52
	95%	1.11	1.60	1.47	1.03
	N	449	604	248	377
NITRITE-NITRATE (mg/l)	Mean	0.10	0.13	0.14	0.10
	Max	1.90	3.10	2.70	1.80
	Min	0.02	0.01	0.02	0.02
	Med	0.07	0.08	0.07	0.06
	95%	0.25	0.36	0.36	0.28
	N	399	580	220	308

CATAWBA-SANTEE WMU-0303

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TOTAL PHOSPHORUS (mg/l)	Mean	0.09	0.15	0.17	0.09
	Max	1.48	1.80	6.30	2.00
	Min	0.02	0.02	0.02	0.02
	Med	0.06	0.07	0.06	0.05
	95%	0.29	0.52	0.50	0.26
	N	485	715	267	372
TOTAL ORGANIC CARBON (mg/l)	Mean	7.9	12.1	10.8	7.5
	Max	30.0	76.0	108.0	47.0
	Min	2.5	1.8	1.6	1.7
	Med	6.4	7.4	6.8	5.8
	95%	17.1	44.0	30.0	17.5
	N	169	172	153	144
SALINITY (PPT)	Mean	15.1	17.8	15.7	15.1
	Max	35.0	40.0	39.0	33.0
	Min	0.0	0.0	0.0	0.0
	Med	17.5	20.0	18.0	18.0
	95%	29.0	33.0	32.0	29.5
	N	460	658	303	358
FECAL COLIFORM BACTERIA (#/100ml)	Mean	56	96	93	56
	Max	2,020	9,000	18,400	1,900
	Min	2	2	2	2
	Med	50	80	85	50
	95%	640	1,600	1,600	700
	N	446	691	333	380

Waterbody Index

Facility Index

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