



## Appendix E: Environmental Inventory



# TECHNICAL MEMORANDUM: ENVIRONMENTAL INVENTORY

Prepared for:



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## 1.1 PROJECT BACKGROUND

The South Carolina Department of Transportation (SCDOT) is conducting a Planning and Environmental Linkages (PEL) study for the Interstate 526 (I-526) Lowcountry Corridor (LCC) EAST project. The project study area extends approximately 10 miles along I-526 from Virginia Avenue in North Charleston, South Carolina to U.S. 17 in Mount Pleasant, South Carolina (Figure 1.1). The project study area is approximately 1,183 acres, which is about 600 feet wide along I-526. The project study area has varying widths around existing interchanges, connecting routes, and existing frontage roads. The project study area traverses multiple jurisdictions including the City of Charleston, the City of North Charleston, the Town of Mount Pleasant, Charleston County, and Berkeley County. This Environmental Inventory Technical Memorandum describes the environmental and social resources present within the I-526 LCC EAST project study area. Resource study areas were determined for each resource analyzed. Table 1.1 provides a summary of the resource study areas.

I-526 is an interstate facility that provides a partial beltway around Charleston and acts as a bypass for traffic on U.S. 17 through downtown Charleston. This corridor serves as a major commuter corridor and a major economic connector in the lowcountry, linking the goods to and from the South Carolina Port Authority Wando Welch Terminal with Interstate 26 (I-26) and other integral components of the state's freight network. The corridor is also heavily used by tourists traveling to Sullivan's Island, Isle of Palms, and other Charleston area destinations.

Figure 1.1: Project Study Area

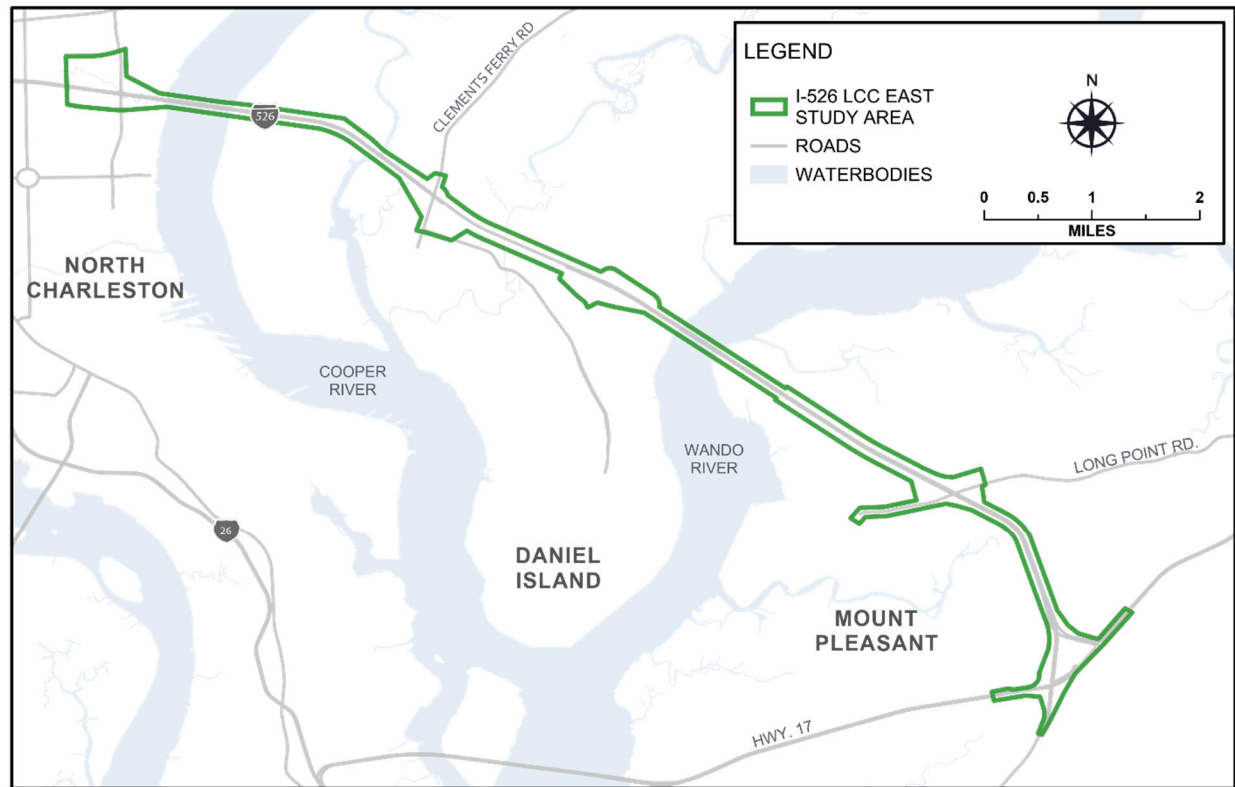


Table 1.1: Resource Study Areas

| Environmental Resource                                                                                                                                                                        | Resources Study Area                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Land Use                                                                                                                                                                                      | 500 feet buffer of the project study area                                                                              |
| Schools and Places of Worship                                                                                                                                                                 | 2,000 feet buffer of the project study area                                                                            |
| Parks and Recreational Facilities                                                                                                                                                             | 2,000 feet buffer of the project study area                                                                            |
| Planned Developments                                                                                                                                                                          | Regional                                                                                                               |
| Population                                                                                                                                                                                    | U.S. Census Block Groups intersecting the project study area                                                           |
| Employment                                                                                                                                                                                    | U.S. Census Block Groups intersecting the project study area                                                           |
| Population and Employment Forecasts                                                                                                                                                           | Neighborhoods (Traffic Analysis Zones from the CHATS Regional Travel Demand Model) intersecting the project study area |
| Income and Poverty                                                                                                                                                                            | U.S. Census Block Groups intersecting the project study area*                                                          |
| Minority Populations                                                                                                                                                                          | U.S. Census Block Groups intersecting the project study area*                                                          |
| Hispanic Populations                                                                                                                                                                          | U.S. Census Block Groups intersecting the project study area*                                                          |
| Limited English Proficiency Populations                                                                                                                                                       | U.S. Census Block Groups intersecting the project study area*                                                          |
| Aquatic Habitats                                                                                                                                                                              | Project study area                                                                                                     |
| Wetlands                                                                                                                                                                                      | Project study area                                                                                                     |
| Floodplains                                                                                                                                                                                   | Project study area                                                                                                     |
| Federally Protected Species                                                                                                                                                                   | Project study area                                                                                                     |
| Essential Fish Habitat                                                                                                                                                                        | Project study area                                                                                                     |
| Farmlands                                                                                                                                                                                     | Project study area                                                                                                     |
| Air Quality                                                                                                                                                                                   | Regional                                                                                                               |
| Hazardous Materials Site                                                                                                                                                                      | Project study area                                                                                                     |
| Cultural Resources                                                                                                                                                                            | Area of Potential Effect (91-meter buffer of the project study area)                                                   |
| * For future additional analysis, supplements to Census data is recommended, including the FHWA Screening Tool for Equity Analysis of Projects and the EPA Environmental Justice Screen Tool. |                                                                                                                        |

## 1.2 OVERVIEW OF ENVIRONMENTAL INVENTORY

This environmental inventory identifies environmental resources and environmentally sensitive areas within the project study area. The project study area is 10 miles of I-526 bounded by Virginia Avenue to the west and U.S. 17 to the east. The purpose of the environmental inventory is to identify resources early in the planning process and to identify potential red flag resource areas for use in the evaluation of alternatives. Information provided in the analysis is primarily composed of readily available data and preliminary field survey information.

## 1.3 METHODOLOGY

An analysis was completed to determine social, natural, and cultural resources within varying extents outside the I-526 LCC EAST project study area. These buffer areas vary based on the resource assessed as shown in Table 1.1. Social resources assessed include land use, schools and places of worship, parks and recreational areas, planned developments, community demographics, and environmental justice. Natural resources assessed include wetland habitats, essential fish habitat, floodplains, protected species, farmlands, air quality, and hazardous materials. Table 1-2 lists the data sources referenced for each environmental resource.

Table 1.2: Data Sources Used in Environmental Inventory Document

| Environmental Resource                  | Source                                                                                                                                                                                                                              |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Land Use                                | Berkeley, Charleston, and Dorchester Council of Governments (2018), City of Charleston (2018), Charleston County (2019)                                                                                                             |
| Schools and Places of Worship           | Study Team Field Survey (2018), Google Earth online mapping (2018, 2019, 2020, 2021)                                                                                                                                                |
| Parks and Recreational Facilities       | Study Team Field Survey (2018), Google Earth online mapping (2018, 2019, 2020, 2021)                                                                                                                                                |
| Planned Developments                    | Berkeley County Geographic Information Systems Department (2020)                                                                                                                                                                    |
| Population                              | U.S. Census American Community Survey 1-Year Estimates (2010, 2015, 2019)                                                                                                                                                           |
| Employment                              | U.S. Bureau of Economic Analysis (2021)                                                                                                                                                                                             |
| Population and Employment Forecasts     | CHATS Regional Travel Demand Model 2015-2050                                                                                                                                                                                        |
| Income and Poverty                      | U.S. Census American Community Survey Data 1-Year Estimates (2019)                                                                                                                                                                  |
| Minority Populations                    | U.S. Census American Community Survey Data 5-Year Estimates (2019)                                                                                                                                                                  |
| Hispanic Populations                    | U.S. Census American Community Survey Data 5-Year Estimates (2019)                                                                                                                                                                  |
| Limited English Proficiency Populations | U.S. Census American Community Survey Data 5-Year Estimates (2019)                                                                                                                                                                  |
| Aquatic Habitats                        | Study Team Natural Resources Field Survey Field Survey (2018–2019), United States Geological Survey National Land Cover Data (2018)                                                                                                 |
| Wetlands                                | Study Team Natural Resources Field Survey (2019), South Carolina Department of Natural Resources Digital Elevation Models (2015), National Land Cover Data (2018), U.S. Fish and Wildlife Service National Wetland Inventory (2019) |
| Floodplains                             | Federal Emergency Management Administration Flood Zones (2018)                                                                                                                                                                      |
| Federally Protected Species             | Study Team Natural Resources Field Survey (2019), South Carolina Department of Natural Resources (2017), U.S. Fish and Wildlife Service (2019)                                                                                      |
| Essential Fish Habitat                  | Study Team Natural Resources Field Survey (2019), National Oceanic and Atmospheric Administration National Marine Fisheries Service (2018)                                                                                          |
| Farmlands                               | U.S. Department of Agriculture Natural Resources Conservation Service (2019)                                                                                                                                                        |
| Air Quality                             | Environmental Protection Agency (2021)                                                                                                                                                                                              |
| Hazardous Materials Site                | Environmental Record Search (2020)                                                                                                                                                                                                  |
| Cultural Resources                      | Study Team Field Survey (2019), SCArchSite (2019)                                                                                                                                                                                   |



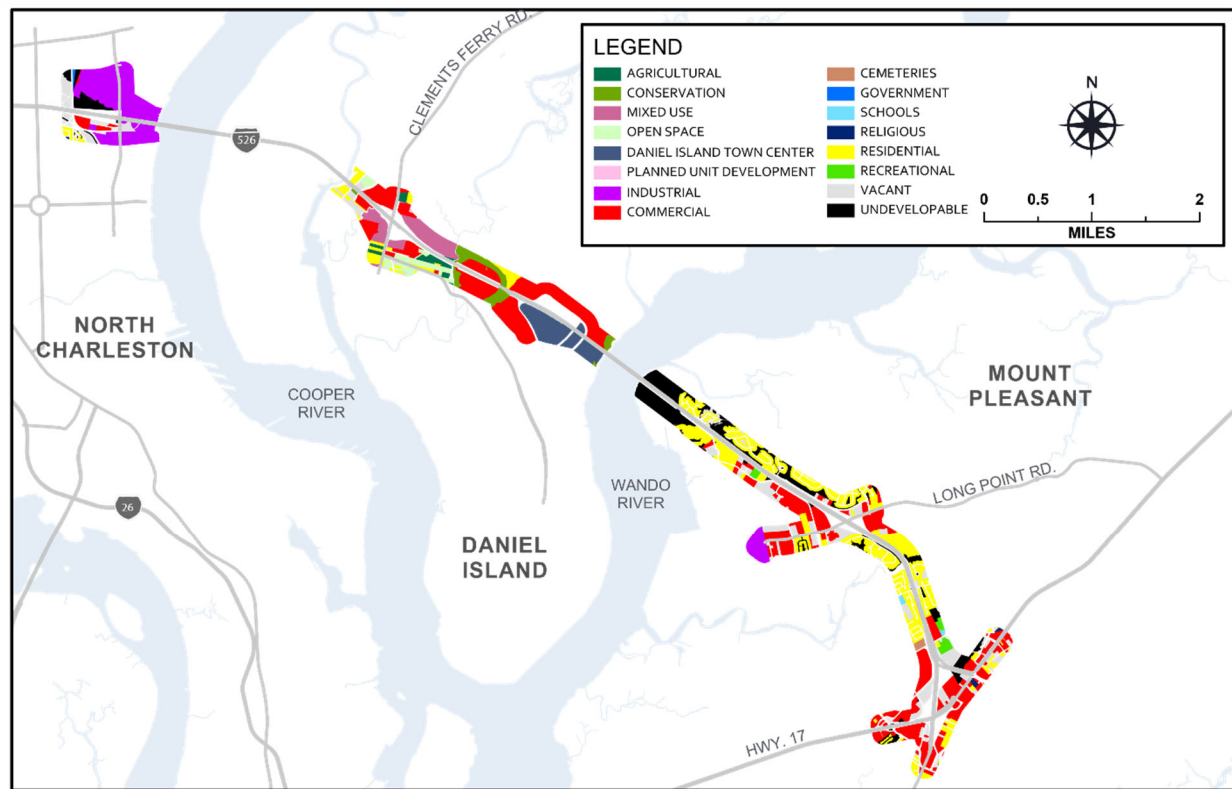
The social environment includes the characteristics of the people and land uses within the project study area. Social resources include the land use, schools and places of worship, parks and recreational areas, planned developments, community demographics (population, employment), and environmental justice considerations (income and poverty, minority populations, Hispanic populations, and limited English proficiency populations) within the project study area.

### 2.1 LAND USE

The project study area is composed of several jurisdictions, including portions of the City of Charleston, the City of North Charleston, the Town of Mount Pleasant, Charleston County, and Berkeley County. Because the project study area traverses several jurisdictions, existing land use data was compiled from a variety of sources. In determining land use for all portions of the project study area, existing land use was compiled from three sources, including Charleston County, the City of Charleston, and the metropolitan planning organization, the Berkeley, Charleston, and Dorchester Council of Governments (BCDCOG). Charleston County maintains geographic data for existing land use. The BCDCOG maintains existing land use for Berkeley County. The City of Charleston, however, only maintains geographic data for existing zoning. Zoning is a form of land use control, and typically, the existing land use complies with the existing zoning. These three data sources were compiled to determine existing land use within the project study area and within 500 feet of the project study area. The overall existing land use map is shown in Figure 2.1.

Land uses within and adjacent to the project study area vary, including residential, commercial, and industrial uses (Figure 2.1). From the western extent of the corridor in North Charleston, the dominant land use is industrial, with some residential use on the south side of the corridor. Moving east across the Cooper River, the land use on Daniel Island includes residential, commercial, and vacant or undevelopable uses because of the natural wetlands on the island. Moving east across the Wando River, the land use in Mount Pleasant is dominated by residential and commercial uses. Recreational uses are present, along with industrial uses at the western terminus of Long Point Road. This portion of the corridor also includes vacant or undevelopable uses because of the presence of wetlands.

Figure 2.1: Existing Land Use



Source: BCDCOG (2018), Charleston County (2019), and City of Charleston (2018).

## 2.2 SCHOOLS AND PLACES OF WORSHIP

A resource study area was established to determine schools and places of worship by adding a 2,000-foot buffer to the project study area. Schools and places of worship are important and valued social resources to communities. In 2018, a field survey was conducted to identify schools and places of worship within the resource study area. In addition, Google Earth online mapping was used in 2018, 2019, 2020, and 2021 to verify the 2018 field survey. Eight schools (Table 2.1) and 19 places of worship (Table 2.2) were identified within the project study area and within 2,000 feet of the project study area.

Table 2.1: Schools

| School                                          | Location         |
|-------------------------------------------------|------------------|
| Belle Hall Elementary                           | Mount Pleasant   |
| Palmetto Christian Academy                      | Mount Pleasant   |
| Trident Academy                                 | Mount Pleasant   |
| Crown Leadership Academy                        | Mount Pleasant   |
| Lucy Beckham High School                        | Mount Pleasant   |
| James B. Edwards Elementary School              | Mount Pleasant   |
| Lowcountry Learners Preschool                   | Mount Pleasant   |
| Trident Technical College Mount Pleasant Campus | North Charleston |

Source: Study Team Field Survey 2018, Google Earth online mapping 2018, 2019, 2020, 2021

Table 2.2: Places of Worship

| Place of Worship                      | Location         |
|---------------------------------------|------------------|
| Pittman Street Baptist Church         | North Charleston |
| Church of the Resurrection            | North Charleston |
| Providence Church                     | Daniel Island    |
| Intercession Church                   | Daniel Island    |
| ONE Fellowship                        | Daniel Island    |
| Saint James Church                    | Daniel Island    |
| Crosspoint Charleston                 | Daniel Island    |
| Saint Clare of Assisi Catholic Church | Daniel Island    |
| The Rising Church                     | Daniel Island    |
| Christ Church Presbyterian            | Mount Pleasant   |
| Life Community Church                 | Mount Pleasant   |
| East Cooper Baptist Church            | Mount Pleasant   |
| The East Cooper Episcopal Church      | Mount Pleasant   |
| New Hope Church                       | Mount Pleasant   |
| Oceanside Church                      | Mount Pleasant   |
| Good Shephard Lutheran Church         | Mount Pleasant   |
| Olive Branch                          | Mount Pleasant   |
| Grace Bible Church                    | Mount Pleasant   |
| Liberty Baptist Church                | Mount Pleasant   |

Source: Study Team Field Survey 2018, Google Earth online mapping 2018, 2019, 2020, 2021

## 2.3 PARKS AND RECREATIONAL AREAS

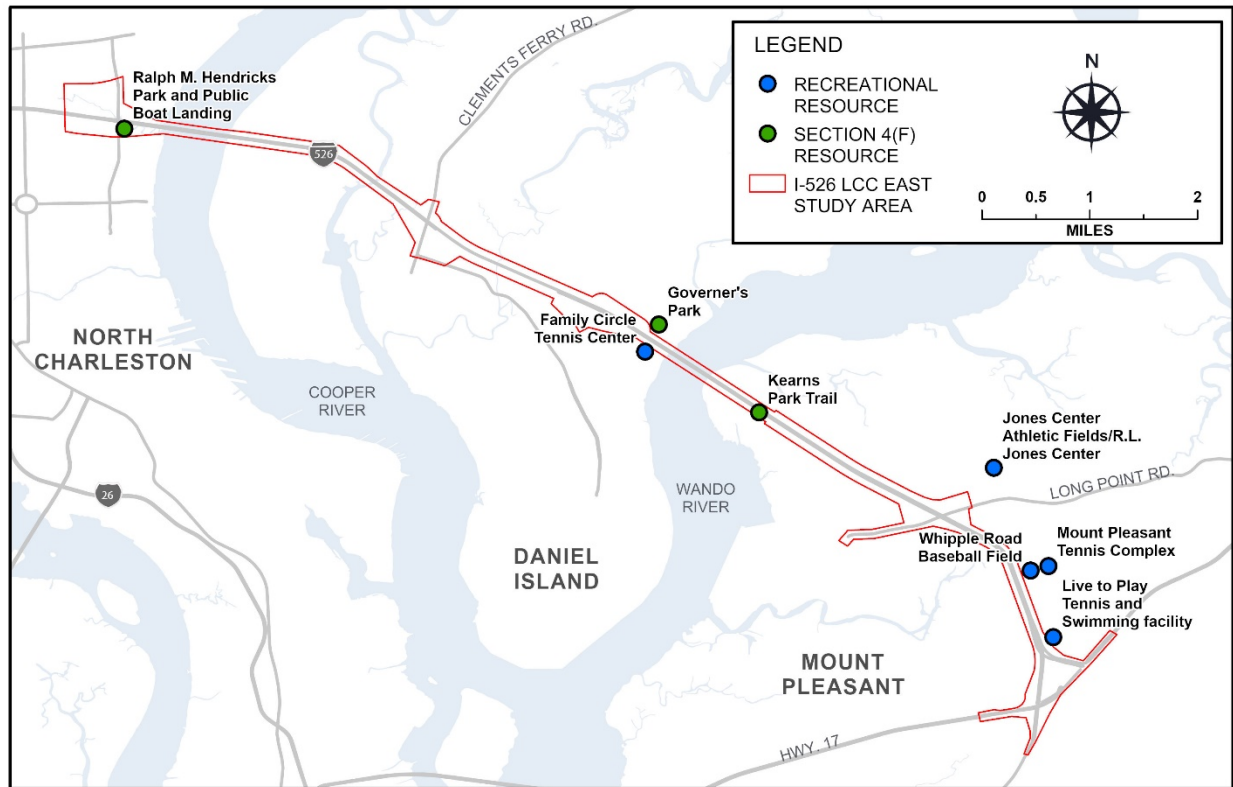
A resource study area was established to determine parks and recreational areas by adding a 2,000-foot buffer to the project study area. Recreational resources are important community facilities that warrant consideration during transportation projects. These resources include publicly owned parks and recreation facilities. In 2018, a field survey was conducted to identify parks and potential recreation resources within the resource study area. In addition, Google Earth online mapping was used in 2018, 2019, 2020, and 2021 to verify and supplement the 2018 field survey. Eight parks and recreational areas are listed in Table 2.3 and shown in Figure 2.2.

Table 2.3: Parks and Recreational Areas

| School                                                         | Location         | Resource Type         |
|----------------------------------------------------------------|------------------|-----------------------|
| Ralph M. Hendricks Park and Public Boat Landing                | North Charleston | Section 4(f) Resource |
| Governor's Park                                                | Daniel Island    | Section 4(f)          |
| Family Circle Tennis Center/Live to Play (LTP) - Daniel Island | Daniel Island    | Recreational Resource |
| Kearns Park Trail                                              | Mount Pleasant   | Section 4(f)          |
| Jones Center Athletic Fields/R.L. Jones Center                 | Mount Pleasant   | Recreational Resource |
| Mount Pleasant Tennis Complex                                  | Mount Pleasant   | Recreational Resource |
| Whipple Road Baseball Field                                    | Mount Pleasant   | Recreational Resource |
| LTP - Mount Pleasant Tennis and Swimming Facility              | Mount Pleasant   | Recreational Resource |

Source: Study Team Field Survey 2018, Google Earth online mapping 2018, 2019, 2020, 2021

Figure 2.2: Recreational Areas and Section (4)f Resources



Source: Study Team Field Survey (2018), Google Earth online mapping (2018, 2019, 2020, 2021)

The Medical University of South Carolina Health Stadium is adjacent to the project study area on Daniel Island. The stadium used to be the venue for the Charleston Battery soccer team. The stadium was sold in 2019 to a developer with the intent to redevelop the property for residential and commercial purposes.<sup>1</sup> The stadium was slated to be torn down late 2019/early 2020,<sup>2</sup> but as of February 2021, the stadium has not been torn down. No additional information was found regarding the redevelopment status of the stadium.

The Family Circle Tennis Center is a tennis facility on Daniel Island, south of the project study area. The Family Circle Tennis Center is owned by the City of Charleston and is operated by Charleston Tennis LLC. The facility is a part of the LTP Tennis organization, which has facilities on both Daniel Island and Mount Pleasant. The facility is membership-based.

### 2.3.1 Section 4(f)

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 stipulates that the Federal Highway Administration (FHWA) and other USDOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historic

<sup>1</sup> McDermott, J. (2019). Charleston Battery's home field is sold, redevelopment to start after the season. *The Post and Courier*. Accessed February 15, 2021. Retrieved from [https://www.postandcourier.com/business/real\\_estate/charleston-batterys-home-field-is-sold-redevelopment-to-start-after-the-season/article\\_0f596c5e-822d-11e9-b521-8fc4bbe3e2c4.html](https://www.postandcourier.com/business/real_estate/charleston-batterys-home-field-is-sold-redevelopment-to-start-after-the-season/article_0f596c5e-822d-11e9-b521-8fc4bbe3e2c4.html).

<sup>2</sup> Miller, A. (2019). Charleston Battery says goodbye to MUSC Health Stadium with convincing victory. *The Post and Courier*. Accessed February 15, 2021. Retrieved from [https://www.postandcourier.com/sports/charleston-battery-says-goodbye-to-musc-health-stadium-with-convincing-victory/article\\_f99003be-f2b2-11e9-9fdf-4b0c9808b079.html](https://www.postandcourier.com/sports/charleston-battery-says-goodbye-to-musc-health-stadium-with-convincing-victory/article_f99003be-f2b2-11e9-9fdf-4b0c9808b079.html).

sites unless there is no feasible and prudent alternative to the use of the land, and the action includes all possible planning to minimize harm to the property resulting from use.<sup>3</sup>

Within the resource study area for parks and recreational areas, Ralph M. Hendricks, Governor's Park, and Kearns Park Trail are Section 4(f) resources. As a result, these three parks must be evaluated for Section 4(f) potential impacts through future National Environmental Policy Act (NEPA) studies.

### 2.3.2 Section 6(f)

Some park and recreational resources are also regulated under the Land and Water Conservation Fund Act of 1965, which established a federal funding program to assist states in developing outdoor recreation sites. Section 6(f) of the act prohibits the conversion of property acquired or developed with these funds to a non-recreational purpose without the approval of the National Park Service.<sup>4</sup> No Section 6(f) resources were identified within the resource study area for parks and recreational areas.

## 2.4 PLANNED DEVELOPMENTS

Development and growth are expected within the region and may affect the I-526 LCC EAST project study area. Within Berkeley County, 21 residential developments are planned for development on Daniel Island, predominately along Clements Ferry Road, according to Berkeley County as of June 2020.<sup>5</sup> These residential developments are shown in Table 2.4.

**Table 2.4: Planned Developments on Daniel Island in Berkeley County**

| Development Name           | Road                    | Expected Number of Units |
|----------------------------|-------------------------|--------------------------|
| St. Thomas Subdivision     | Amalie Farms Drive      | 68 units                 |
| Shellring                  | Clouter Creek Drive     | 104 units                |
| Emerald Gates              | St. Thomas Island Drive | 13 units                 |
| Governor's Caye            | Clements Ferry Road     | 500 units                |
| The Bluffs at Pinefield    | Clements Ferry Road     | 79 units                 |
| Enterprise Development     | Clements Ferry Road     | 75 units                 |
| Accent Point Apartments    | Clements Ferry Road     | 283 units                |
| The Huggins Tract          | Clements Ferry Road     | 600 units                |
| Creekside at Beresford     | Clements Ferry Road     | 53 units                 |
| Ryders Landing             | Clements Ferry Road     | 25 units                 |
| Retreat at Beresford       | Clements Ferry Road     | 83 units                 |
| The Landings at Sweetwater | Clements Ferry Road     | 414 units                |
| Cooper River Farms         | Clements Ferry Road     | 300 units                |
| Beresford Commons          | Clements Ferry Road     | 252 units                |
| The Cove at Martin's Creek | Clements Ferry Road     | 16 units                 |
| Nellfield Plantation       | Clements Ferry Road     | 308 units                |
| Crescent Cove              | Clements Ferry Road     | 20 units                 |
| Cainhoy Plantation         | Clements Ferry Road     | 18,252 units             |
| Boals Farm                 | Clements Ferry Road     | 438 units                |
| Oak Bluff                  | Clements Ferry Road     | 150+ units               |
| Wando Village              | SC 41                   | 418 units                |

Source: Berkeley County (2020)

<sup>3</sup> Federal Highway Administration. (1966). Section 4(f) Tutorial. Accessed February 15, 2021. Retrieved from <https://www.environment.fhwa.dot.gov/section4f/default.aspx>.

<sup>4</sup> National Park Service. (2008). State Land and Water Conservation Fund. Accessed February 15, 2021. Retrieved from <https://www.nps.gov/ncrc/programs/lwcf/protect.html>.

<sup>5</sup> Berkeley County. (2020). Entitled Developments, Berkeley County, South Carolina. Accessed February 9, 2021.

## 2.5 COMMUNITY DEMOGRAPHICS

Existing community demographics were determined from data collected from the U.S. Census Bureau American Community Survey (ACS) and the U.S. Bureau of Economic Analysis for population, employment, and environmental justice considerations including income and poverty, minority populations, Hispanic populations, and limited English proficiency populations. ACS 1-Year Estimates were used for data at the county and state level and ACS 5-Year Estimates were used for data at the U.S. Census block group level. Forecasted community demographics were determined for population and employment from the Charleston Area Transportation Study (CHATS) Regional Travel Demand Model 2015–2050. Within the travel demand model, neighborhoods are represented as traffic analysis zones. The traffic analysis zones intersecting the project study area were assessed for forecasted community demographics.

### 2.5.1 Population

According to the Charleston Regional Development Alliance, the Charleston region is growing three times faster than the national average, with 30 new people moving to the region each day. Data from the U.S. Census Bureau ACS 1-Year Estimates were used to identify the existing population within the region and state. Table 2.5 identifies the populations for 2010, 2015, and 2019; percent change; and annual growth rates for Berkeley and Charleston counties compared to the state.

**Table 2.5: Historical Population Growth, 2010, 2015, and 2019**

| Area              | 2010      | 2015      | 2019      | Percent Change from 2010 to 2019 | Annual Growth from 2010 to 2019 |
|-------------------|-----------|-----------|-----------|----------------------------------|---------------------------------|
| Berkeley County   | 178,783   | 202,786   | 227,907   | 27.4%                            | 3.05%                           |
| Charleston County | 351,482   | 389,262   | 411,406   | 17.0%                            | 1.89%                           |
| South Carolina    | 4,636,312 | 4,896,146 | 5,148,714 | 11.0%                            | 1.22%                           |

Source: U.S. Census Bureau American Community Survey 1-Year Estimates (2010, 2015, 2019)

Overall, both counties are experiencing population growth. Of the two counties, Berkeley County has experienced the most population growth from 2010 to 2019, with a 27.4 percent increase and 3.05 percent annual growth.

Population forecasts were developed from the CHATS Interim Regional Travel Demand Model. Extensive population growth is projected for neighborhoods intersecting the project study area from the base year 2015 to the forecast year 2050. Table 2.6 summarizes the forecasted population growth for the neighborhoods adjacent to the I-526 LCC EAST project study area.

**Table 2.6: CHATS Travel Demand Model 2015 to 2050 Population Forecasts**

| Neighborhood     | Base Year 2015 | Forecast Year 2050 | Percent Change |
|------------------|----------------|--------------------|----------------|
| North Charleston | 123,524        | 177,544            | 43.7%          |
| Daniel Island    | 13,965         | 84,751             | 506.8%         |
| Wando Terminal   | 2,492          | 3,303              | 32.5%          |
| Mount Pleasant   | 83,940         | 117,473            | 39.9%          |

Source: Charleston Area Transportation Study Regional Travel Demand Model 2015–2050

## 2.5.2 Employment

The Charleston region has experienced significant employment growth from 2010 to 2019. Data from the U.S. Bureau of Economic Analysis were used to identify the existing employment within the region and state. Table 2.7 shows the historical employment growth for Berkeley and Charleston counties for 2010, 2015, and 2019, along with percent change and annual growth rates in comparison to the state.

**Table 2.7: Historical Employment Growth, 2010, 2015, and 2019**

| Area              | 2010      | 2015      | 2019      | Percent Change from 2010 to 2019 | Annual Growth from 2010 to 2019 |
|-------------------|-----------|-----------|-----------|----------------------------------|---------------------------------|
| Berkeley County   | 56,409    | 69,980    | 84,415    | 49.6%                            | 5.51%                           |
| Charleston County | 283,262   | 328,455   | 368,450   | 30.0%                            | 3.34%                           |
| South Carolina    | 2,357,627 | 2,636,738 | 2,901,536 | 23.0%                            | 2.56%                           |

Source: Bureau of Economic Analysis (2010, 2015, 2019)<sup>6</sup>

Both counties have experienced significant employment growth from 2010 to 2019. Berkeley County has experienced the highest percent change over the 9-year period—more than double the percent growth of the state during the same period.

The CHATS Regional Travel Demand Model forecasts extensive employment growth in the neighborhoods adjacent to the I-526 LCC EAST project study area from base year 2015 to forecast year 2050. Table 2.8 shows the forecasted employment growth for the neighborhoods intersecting the I-526 LCC EAST project study area.

**Table 2.8: CHATS Travel Demand Model 2015 to 2050 Employment Forecasts**

| Area                 | 2015   | 2050    | Percent Change |
|----------------------|--------|---------|----------------|
| North Charleston     | 91,159 | 121,367 | 33.1%          |
| Daniel Island        | 10,473 | 21,617  | 106.4%         |
| Wando Welch Terminal | 3,693  | 5,919   | 60.2%          |
| Mount Pleasant       | 45,133 | 77,955  | 72.7%          |

Source: Charleston Area Transportation Study Regional Travel Demand Model 2015–2050

## 2.6 ENVIRONMENTAL JUSTICE

Environmental justice is a public policy goal of promoting the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies. Environmental justice is defined through the following principles that, when implemented, help ensure the fair distribution of the benefits and burdens associated with any program or activity receiving federal financial assistance:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process

<sup>6</sup> Bureau of Economic Analysis. Total Full-Time and Part-Time Employment by NAICS Industry. Accessed February 5, 2021. Retrieved from <https://apps.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1>.



- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

Evaluating the population composition within the project study area provides a basis for future outreach activities, assessing impacts to the local community, and evaluating potential alternatives with respect to environmental justice requirements.

Data from the U.S. Census Bureau ACS 5-Year Estimates were evaluated to determine whether minority or low-income populations are present within Census block groups within and adjacent to the project study area.

### 2.6.1 Income and Poverty

Income and poverty statistics for Berkeley and Charleston counties were determined from the 2019 ACS 1-Year Estimates (see Table 2.9). Overall, Berkeley and Charleston counties have a higher median household income compared to the state. Charleston County has the highest median income of the two counties, with a median household income of \$71,531 compared to the state's median household income of \$56,227.

**Table 2.9: Berkeley and Charleston Counties Income and Poverty, 2019**

| Area              | Median Household Income | Percent of Individuals Below Poverty Level | Percent of Zero Vehicle Households |
|-------------------|-------------------------|--------------------------------------------|------------------------------------|
| Berkeley County   | \$69,398                | 10.7%                                      | 3.4%                               |
| Charleston County | \$71,531                | 11.2%                                      | 6.8%                               |
| South Carolina    | \$56,227                | 13.8%                                      | 6.0%                               |

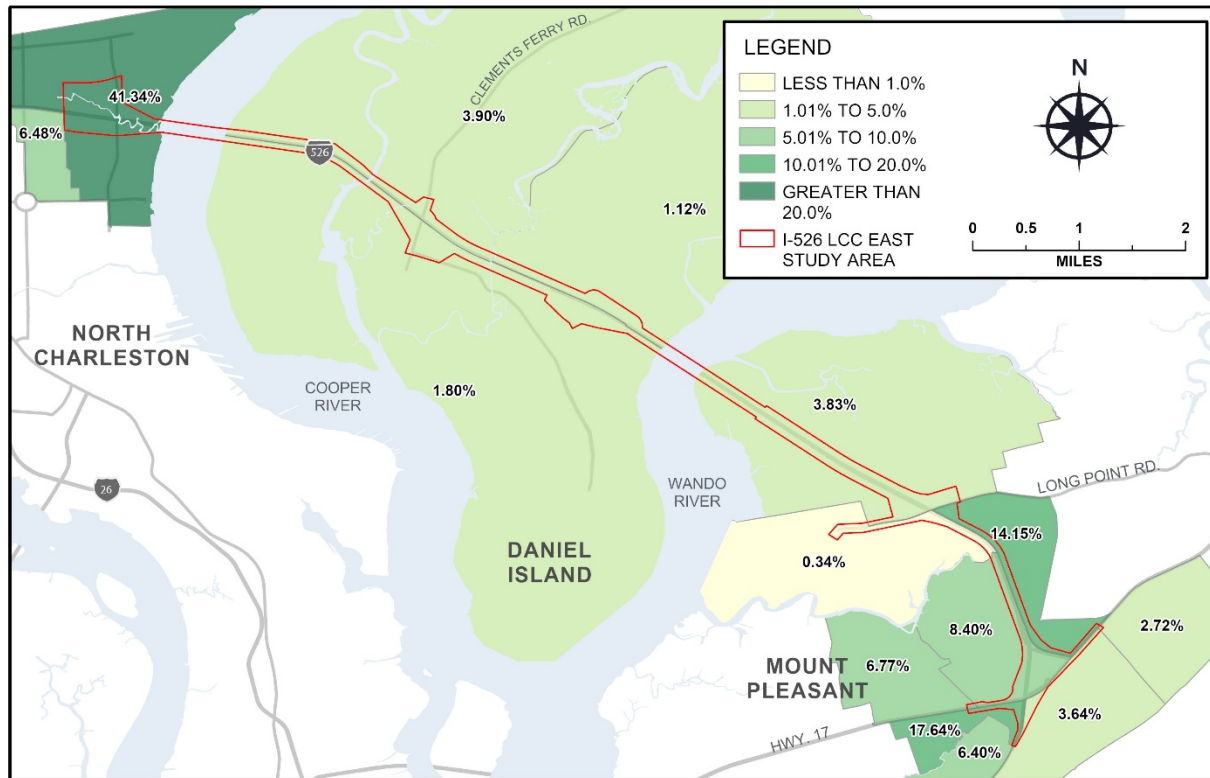
Source: U.S. Census Bureau American Community Survey 1-Year Estimates, 2019

Berkeley and Charleston counties have a lower percent of individuals below the poverty level compared to the state. Charleston County has a greater percentage of individuals below poverty level, with 11.2 percent. The state's percentage of households below poverty level is 13.8 percent. Figure 2.3 shows a map of the I-526 LCC EAST project study area and the percentage of households with income below the poverty level by U.S. Census block group from the 2019 ACS 5-Year Estimates.

Of the two counties, Charleston County has the highest percentage of zero vehicle households (6.8 percent), which is slightly greater than the state's zero vehicle household percentage of 6.0 percent.



Figure 2.3: Low Income Populations, 2019



Source: U.S. Census Bureau American Community Survey 5-Year Estimates (2019)

## 2.6.2 Minority Populations

Minority populations were determined from the 2019 ACS 5-Year Estimates. Table 2.10 lists the 2019 percentages of minority populations for each U.S. Census block group that intersects the I-526 LCC EAST project study area. Figure 2.4 shows a map of the locations of minority populations within and near the I-526 LCC EAST project study area.

In North Charleston, the highest minority population of the I-526 LCC EAST project study area is nearest the Don Holt bridge (Block Group 4, Census Tract 34), with 62.74 percent minority population. Southwest of this block group is the Park Circle area (Block Group 1, Census Tract 35), which has a minority population of 17.83 percent.

On Daniel Island, the block group with the highest percent minority encompasses the Clements Ferry Road area (Block Group 1, Census Tract 204.04), with 33.88 percent. The Daniel Island Drive area (Block Group 1, Census Tract 204.03) has a minority population of 7.07 percent and the Seven Farms Drive area (Block Group 2, Census Tract 204.03) has a minority population of 3.14 percent.

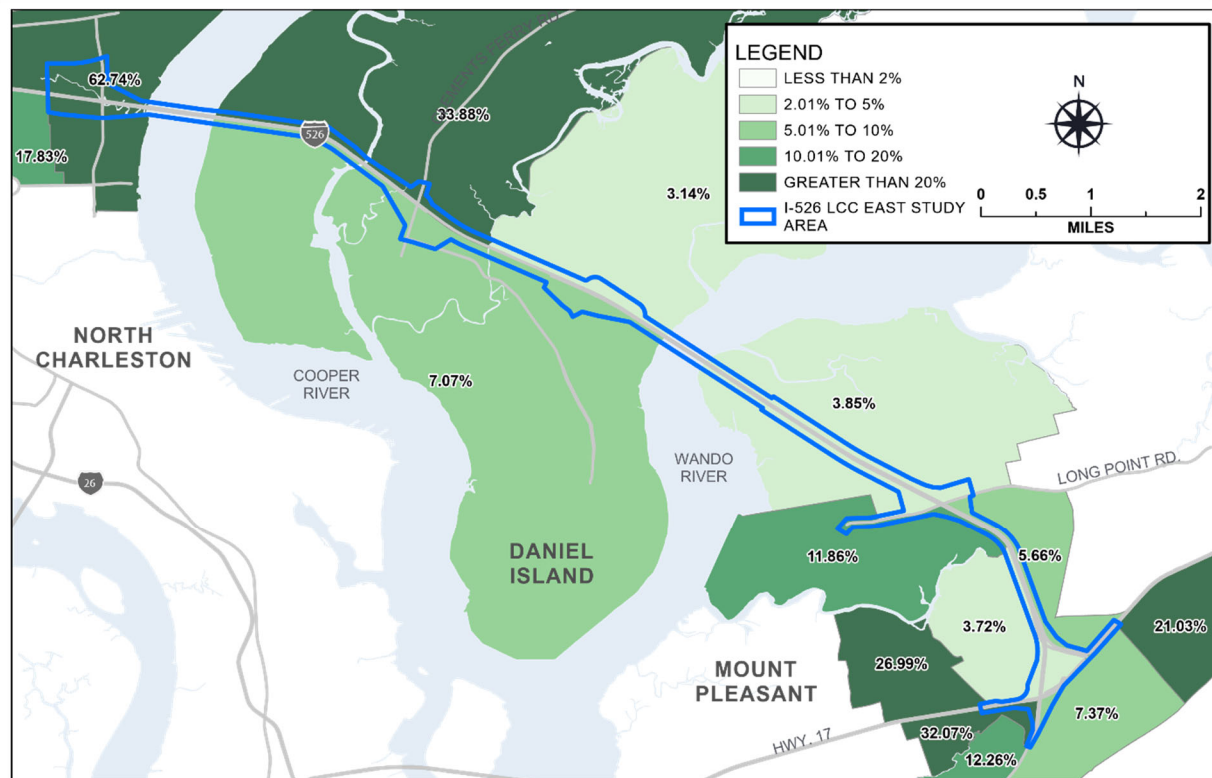
In Mount Pleasant, the block groups south of Long Point Road and west of I-526 have the higher minority populations in Mount Pleasant. The block group with the highest minority population is south of U.S. 17 and west of I-526/Chuck Dawley Boulevard (Block Group 4, Census Tract 46.07), with 32.07 percent. The surrounding block groups have minority populations ranging from 3 to 32 percent. The second highest minority population is located north of U.S. 17 and west of I-526 (Block Group 3, Census Tract 46.06), with 26.99 percent.

Table 2.10: Minority Populations, 2019

| Block Group                                          | Area                                                                                    | Percent Minority Populations |
|------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------|
| Block Group 1, Census Tract 35, Charleston County    | North Charleston south of I-526, Park Circle Area                                       | 17.83%                       |
| Block Group 4, Census Tract 34, Charleston County    | North Charleston north of I-526, North Rhett Avenue/Virginia Avenue Area                | 62.74%                       |
| Block Group 1, Census Tract 204.04, Berkeley County  | Daniel Island north of I-526, Clements Ferry Road Area                                  | 33.88%                       |
| Block Group 2, Census Tract 204.03, Berkeley County  | Daniel Island north of I-526, north of Seven Farm Drive Area                            | 3.14%                        |
| Block Group 1, Census Tract 204.03, Berkeley County  | Daniel Island south of I-526, south of Clements Ferry Road and River Landing Drive Area | 7.07%                        |
| Block Group 2, Census Tract 46.14, Charleston County | Mount Pleasant east of I-526, north of Long Point Road Area                             | 3.85%                        |
| Block Group 1, Census Tract 46.13, Charleston County | Mount Pleasant west of I-526, Wando Welch Terminal Area                                 | 11.86%                       |
| Block Group 1, Census Tract 46.12, Charleston County | Mount Pleasant east of I-526, west of Whipple Road Area                                 | 5.66%                        |
| Block Group 4, Census Tract 46.06, Charleston County | Mount Pleasant west of I-526, north of U.S. 17 Area                                     | 3.72%                        |
| Block Group 3, Census Tract 46.06, Charleston County | Mount Pleasant north of U.S. 17, Mathis Ferry Road Area                                 | 26.99%                       |
| Block Group 4, Census Tract 46.07, Charleston County | Mount Pleasant south of U.S. 17, west of I-526 Area                                     | 32.07%                       |
| Block Group 2, Census Tract 47.02, Charleston County | Mount Pleasant south of U.S. 17, west of I-526/Chuck Dawley Boulevard Area              | 12.26%                       |
| Block Group 3, Census Tract 46.11, Charleston County | Mount Pleasant south of U.S. 17, east of I-526/Chuck Dawley Boulevard Area              | 7.37%                        |
| Block Group 1, Census Tract 46.11, Charleston County | Mount Pleasant south of U.S. 17, north of Venning Road Area                             | 21.03%                       |

Source: U.S. Census Bureau American Community Survey 5-Year Estimates (2019)

Figure 2.4: Minority Populations



Source: U.S. Census Bureau American Community Survey 5-Year Estimates (2019)

### 2.6.3 Hispanic Populations

Hispanic populations were determined from the 2019 ACS 5-Year Estimates. Table 2.11 lists the 2019 Hispanic population percentages for the U.S. Census block groups that intersect the I-526 LCC EAST project study area.

In North Charleston, the block group nearest the Don Holt Bridge (Block Group 4, Census Tract 34) has the highest Hispanic population of the block groups adjacent to the corridor, with 13.83 percent.

Comparatively, Daniel Island has a low Hispanic population percentage. Of the three block groups on Daniel Island, the Clements Ferry Road area (Block Group 1, Census Tract 204.04) has the highest population in the Clements Ferry Road area, with 6.42 percent Hispanic population.

Mount Pleasant also has a low Hispanic population percentage. The block group with the highest percentage of Hispanic population in Mount Pleasant is 7 percent and is located west of Chuck Dawley Boulevard and south of U.S. 17 (Block Group 2, Census Tract 47.02). The second highest Hispanic population is located south of U.S. 17 and north of Venning Road (Block Group 1, Census Tract 46.11), with 4.44 percent.

Table 2.11: Hispanic Populations, 2019

| Block Group                                          | Area                                                                                    | Percent Hispanic Populations |
|------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------|
| Block Group 1, Census Tract 35, Charleston County    | North Charleston south of I-526, Park Circle Area                                       | 1.13%                        |
| Block Group 4, Census Tract 34, Charleston County    | North Charleston north of I-526, North Rhett Avenue/Virginia Avenue Area                | 13.83%                       |
| Block Group 1, Census Tract 204.04, Berkeley County  | Daniel Island north of I-526, Clements Ferry Road Area                                  | 6.42%                        |
| Block Group 2, Census Tract 204.03, Berkeley County  | Daniel Island north of I-526, north of Seven Farm Drive Area                            | 2.58%                        |
| Block Group 1, Census Tract 204.03, Berkeley County  | Daniel Island south of I-526, south of Clements Ferry Road and River Landing Drive Area | 2.46%                        |
| Block Group 2, Census Tract 46.14, Charleston County | Mount Pleasant east of I-526, north of Long Point Road Area                             | 1.53%                        |
| Block Group 1, Census Tract 46.13, Charleston County | Mount Pleasant west of I-526, Wando Welch Terminal Area                                 | 0%                           |
| Block Group 1, Census Tract 46.12, Charleston County | Mount Pleasant east of I-526, west of Whipple Road Area                                 | 0%                           |
| Block Group 4, Census Tract 46.06, Charleston County | Mount Pleasant west of I-526, north of U.S. 17 Area                                     | 4.44%                        |
| Block Group 3, Census Tract 46.06, Charleston County | Mount Pleasant north of U.S. 17, Mathis Ferry Road Area                                 | 0.69%                        |
| Block Group 4, Census Tract 46.07, Charleston County | Mount Pleasant south of U.S. 17, west of I-526 Area                                     | 3.19%                        |
| Block Group 2, Census Tract 47.02, Charleston County | Mount Pleasant south of U.S. 17, west of I-526/Chuck Dawley Boulevard Area              | 7.00%                        |
| Block Group 3, Census Tract 46.11, Charleston County | Mount Pleasant south of U.S. 17, east of I-526/Chuck Dawley Boulevard Area              | 0.58%                        |
| Block Group 1, Census Tract 46.11, Charleston County | Mount Pleasant south of U.S. 17, north of Venning Road Area                             | 4.63%                        |

Source: U.S. Census Bureau American Community Survey 5-Year Estimates (2019)

## 2.6.4 Limited English Proficiency Populations

Limited English proficiency (LEP) households are adjacent to the I-526 LCC EAST project study area. Table 2.12 lists the percentages of LEP households in 2019 for the U.S. Census block groups that intersect the I-526 LCC EAST project study area.

In North Charleston, the block group nearest the Don Holt bridge (Block Group 4, Census Tract 34) has the highest LEP household percentage of the block groups adjacent to the corridor, with 7.82 percent LEP households.

On Daniel Island, the block groups north of I-526 do not have any reported LEP households. The block group south of I-526 (Block Group 1, Census Tract 204.03) has 1.06 percent LEP households.

In Mount Pleasant, the LEP households are mainly clustered around the I-526 and U.S. 17 interchange. The block group south of U.S. 17 and west of Chuck Dawley Boulevard has the greater percentage of LEP households in Mount Pleasant, with 4.63 percent. The second highest LEP household percentage is located east of U.S. 17 and north of Venning Road, with 2.89 percent LEP households.

Table 2.12: 2019 Limited English Proficiency Households

| Block Group                                          | Area                                                                                    | Percent LEP Households |
|------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------|
| Block Group 1, Census Tract 35, Charleston County    | North Charleston south of I-526, Park Circle Area                                       | 0%                     |
| Block Group 4, Census Tract 34, Charleston County    | North Charleston north of I-526, North Rhett Avenue/Virginia Avenue Area                | 7.82%                  |
| Block Group 1, Census Tract 204.04, Berkeley County  | Daniel Island north of I-526, Clements Ferry Road Area                                  | 0%                     |
| Block Group 2, Census Tract 204.03, Berkeley County  | Daniel Island north of I-526, north of Seven Farm Drive Area                            | 0%                     |
| Block Group 1, Census Tract 204.03, Berkeley County  | Daniel Island south of I-526, south of Clements Ferry Road and River Landing Drive Area | 1.06%                  |
| Block Group 2, Census Tract 46.14, Charleston County | Mount Pleasant east of I-526, north of Long Point Road Area                             | 0.67%                  |
| Block Group 1, Census Tract 46.13, Charleston County | Mount Pleasant west of I-526, Wando Welch Terminal Area                                 | 0%                     |
| Block Group 1, Census Tract 46.12, Charleston County | Mount Pleasant east of I-526, west of Whipple Road Area                                 | 0%                     |
| Block Group 4, Census Tract 46.06, Charleston County | Mount Pleasant west of I-526, north of U.S. 17 Area                                     | 0%                     |
| Block Group 3, Census Tract 46.06, Charleston County | Mount Pleasant north of U.S. 17, Mathis Ferry Road Area                                 | 0%                     |
| Block Group 4, Census Tract 46.07, Charleston County | Mount Pleasant south of U.S. 17, west of I-526 Area                                     | 4.63%                  |
| Block Group 2, Census Tract 47.02, Charleston County | Mount Pleasant south of U.S. 17, west of I-526/Chuck Dawley Boulevard Area              | 0%                     |
| Block Group 3, Census Tract 46.11, Charleston County | Mount Pleasant south of U.S. 17, east of I-526/Chuck Dawley Boulevard Area              | 1.12%                  |
| Block Group 1, Census Tract 46.11, Charleston County | Mount Pleasant south of U.S. 17, north of Venning Road Area                             | 2.89%                  |

Source: ACS 5-Year Estimates (2019)

The I-526 LCC EAST project study area's natural resources were evaluated. Natural resources evaluated in the project study area include aquatic habitats, floodplains, protected species, farmlands, air quality, and hazardous material sites.

### 3.1 AQUATIC HABITATS

The study team performed wetland and stream delineations, as well as habitat surveys targeting protected species in Charleston and Berkeley counties between August 2018 and September 2019. The surveys were conducted within the project study area. The project study area has varying widths around existing interchanges, connecting routes, and existing frontage roads. All wetlands were delineated using the methods outlined by the U.S. Army Corps of Engineers (USACE) Atlantic and Gulf Coastal Plain Regional Supplement to determine jurisdictional boundaries.<sup>7</sup> Wetland habitat types were classified using the Cowardin naming convention.<sup>8</sup> Other habitat types were classified using the National Land Cover Data Legend<sup>9</sup>, aerial imagery, and investigator survey notes.

#### 3.1.1 Wetland Habitats

Wetland habitats found within the I-526 LCC EAST project study area between August 2018 and September 2019 include brackish/saline habitats, freshwater habitats, and non-wetland habitats. Habitat types identified within the I-526 LCC EAST corridor based on Cowardin and National Land Cover Data classifications are shown listed in Table 3.1 and mapped in Figure 3.1.

**Table 3.1: Wetland Habitat Types**

| Habitat Type               | Area (acres) | Habitat Percentage within I-526 LCC EAST |
|----------------------------|--------------|------------------------------------------|
| Bottomland hardwood forest | 56.9         | 4.8%                                     |
| Freshwater marsh           | 5.4          | 0.5%                                     |
| Freshwater stream          | 0.8          | 0.1%                                     |
| Maritime forest            | 47.3         | 4.0%                                     |
| Oak/pine upland forest     | 148.6        | 12.6%                                    |
| Pond                       | 12.4         | 1.0%                                     |
| River/tidal creek          | 70.6         | 6.0%                                     |
| Salt marsh                 | 219.4        | 18.5%                                    |
| Shrub/scrub upland         | 17.6         | 1.5%                                     |
| Urban development          | 604          | 51.1%                                    |

Source: Study Team Natural Resources Field Survey (2019).

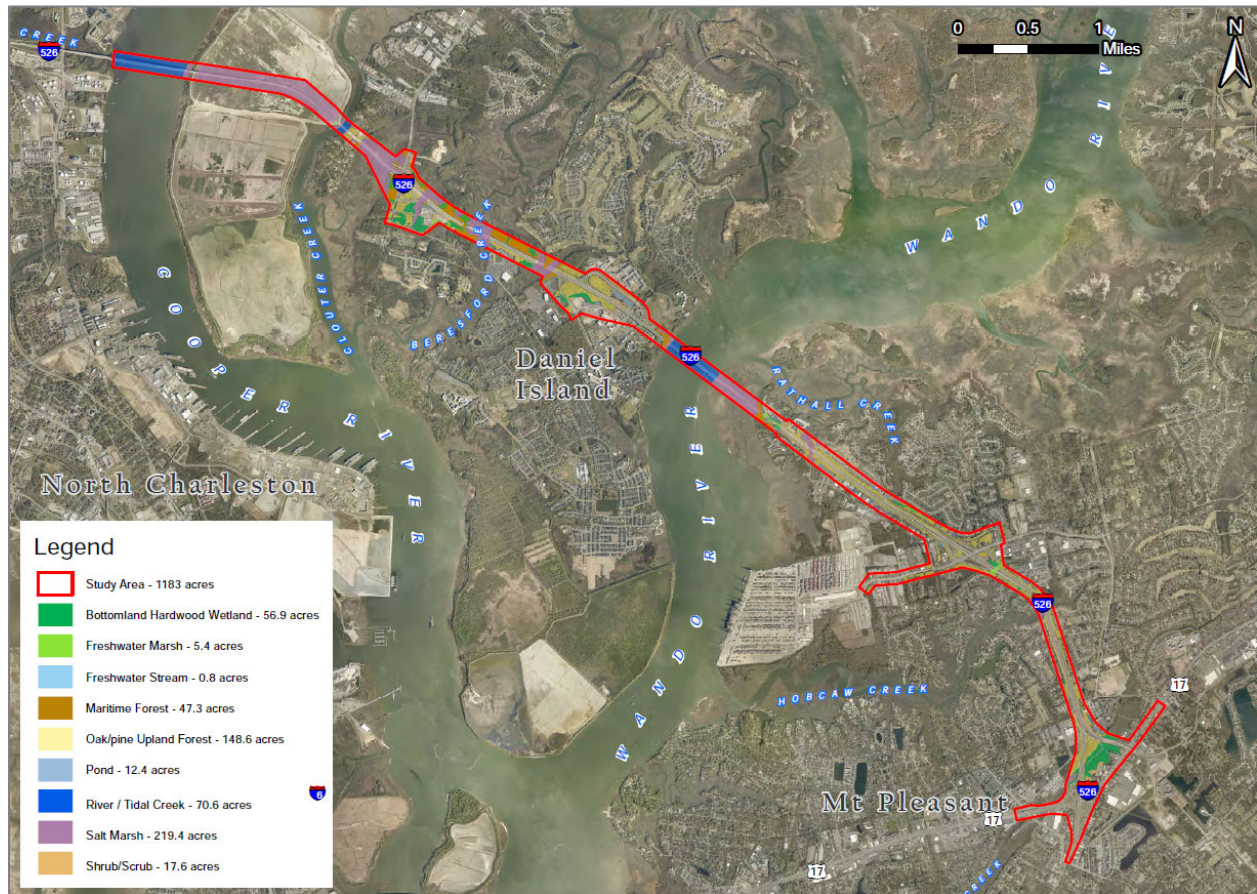
<sup>7</sup> U.S. Army Corps of Engineers. (2010). Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Engineer Research and Development Center. Vicksburg, MS.

<sup>8</sup> Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. (1979). Classification of wetlands and deepwater habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. Accessed February 15, 2021. Retrieved from <http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm> (Version 04DEC98).

<sup>9</sup> Yang, L., Jin, S., Danielson, P., Homer, C.G., Gass, L., Bender, S.M., Case, A., Costello, C., Dewitz, J.A., Fry, J.A., Funk, M., Granneman, B.J., Liknes, G.C., Rigge, M.B., and Xian, G. (2018) A new generation of the United States National Land Cover Database—Requirements, research priorities, design, and implementation strategies: ISPRS Journal of Photogrammetry and Remote Sensing, v. 146, p. 108–123. Accessed February 15, 2021. Retrieved from <https://doi.org/10.1016/j.isprsjprs.2018.09.006>. Download at: <https://www.mrlc.gov/data?f%5B0%5D=category%3Aland%20cover>.



Figure 3.1: Wetland Habitat Types



Source: Study Team Natural Resources Survey (March 2019)

For additional details on wetlands habitats within the project study area, reference the attached Natural Resources Survey Results document.

### Brackish/Saline Habitats

Brackish/saline habitats within the project study area include salt marsh, rivers and large tidal creeks, and maritime forests.

Salt marsh habitats (Estuarine emergent wetlands [USFWS 1979]) are a single-species community of saltmarsh cordgrass (*Spartina alterniflora*) in the low marsh within the project area. The high marsh consists of black needle rush (*Juncus roemerianus*), glasswort (*Salicornia spp.*), salt grass (*Distichlis spp.*), and big cordgrass (*Spartina cynosuroides*). These emergent wetlands often have moderately salt-tolerant woody species above the tidal zone such as marsh elder (*Iva spp.*), groundsel bush (*Baccharis spp.*), Southern red cedar (*Juniperus virginiana*), and cabbage palms (*Sabal palmetto*). Intertidal zones may have exposed mud or sand at low tide.

Rivers and large tidal creek habitats (Estuarine sub-tidal unconsolidated bottom [USFWS 1979]) consist of the Cooper River, Wando River, and Clouter Creek. Mollusks such as Atlantic oysters, ribbed mussels, and barnacles grow on hard surfaces in the estuarine inter-tidal zone. Oyster beds typically form in the shallow sub-tidal areas, often growing on top of each other. Patches of sea lettuce and sea grass also grow in the shallow sub-tidal areas. Estuarine fishes, mammals, and sea turtles utilize these saline waters.

Maritime forests border brackish or saline areas above the high tide line. Plants in this habitat are tolerant of some saline soil and salt spray. These plants include live oak (*Quercus virginiana*), yaupon holly (*Ilex vomitoria*), palmettos (*Sabal spp.*), southern red cedar (*Juniperus virginiana*), Spanish moss (*Tillandsia usneoides*), and occasionally loblolly pine (*Pinus taeda*).

### Freshwater Habitats

Freshwater habitats within the project study area include freshwater marshes, bottomland hardwood forest, freshwater streams, and ponds.

Freshwater marshes (Palustrine emergent wetlands [USFWS 1979]) include non-woody species such as cattail (*Typha spp.*), lizard's tail (*Saururus cernuus*), spikerush (*Eleocharis palustris*), soft stem rush (*Schoenoplectus tabernaemontani*), and various sedges. They are often bordered by woody shrubs such as buttonbush (*Cephalanthus occidentalis*) and Carolina willow (*Salix caroliniana*). Freshwater emergent wetlands are semi-permanently to permanently flooded, may be tidally influenced, and salt encroachment areas are possible.

Bottomland hardwood forest habitats (Palustrine forested wetlands [USFWS 1979]) are seasonally flooded freshwater forests. Plants within these habitats include a variety of water-tolerant broadleaf trees, loblolly pines, palmettos, shrubs, and sparse herbaceous cover. Areas with long-term flooding are often sparsely vegetated or non-vegetated. The soils and hydrological indicators are used in conjunction with plant species to delineate these areas. Forested freshwater wetlands are found at various elevations. They are frequently found within other habitats, such as uplands, or along the edge of riverine or estuarine habitats.

Freshwater streams (Riverine lower perennial [USFWS 1979]) are low-flowing streams lined with sand and mud. They flow through the uplands and palustrine forested wetlands. They are typically non-vegetated or minimally vegetated. Streams increase in flow with increased precipitation. They often provide connection between wetlands and major waterbodies within the watershed.

Ponds (Palustrine aquatic beds [USFWS 1979]) typically have maintained banks and are surrounded by sod and landscaping. Bald cypress (*Taxodium distichum*) and Carolina willow are frequently surrounding the edge. Ponds with shallow zones have emergent plants such as pickerelweed (*Pontederia cordata*), Carolina water hyssop (*Bacopa caroliniana*), and cattail. Submerged and floating vegetation are common as well.

### Non-wetland Habitats:

Non-wetland habitats found within the project study area include shrub/scrub, oak/pine uplands, and urban development.

Shrub/scrub upland habitats range from open field to young, dense sapling stands. Herbaceous ground cover is a diverse mix of grasses and broad leaf herbs. Saplings are typically sweetgum (*Liquidambar styraciflu*), red maple (*Acer rubrum*), and loblolly pine. Invasive shrubs are also a typical group of plants found in this habitat, such as Chinese privets (*Ligustrum sinense*) and blackberries (*Rubus spp.*).

Oak/pine upland habitats (upland mixed forest) are dominated by loblolly pines with a broadleaf hardwood understory. These areas tend to have drier, sandy soils. Within the corridor, upland mixed forests frequently border areas of development. These forests have not reached maturity or the late forest succession stage because of frequent disturbances.

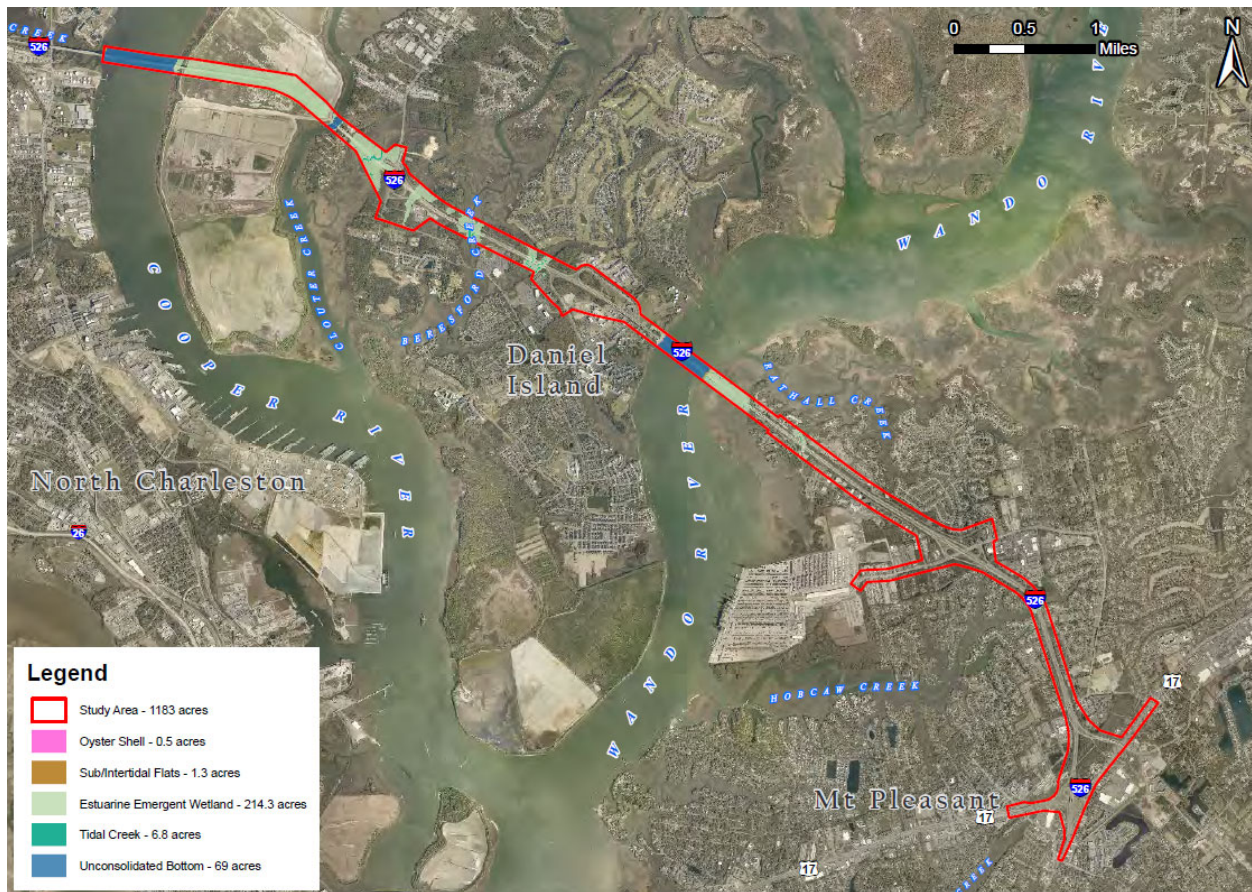


Urban development includes residences, commercial buildings, and roadways. These areas typically have very little natural habitat. They are frequently maintained and landscaped. The acreage for this habitat type was determined by subtracting the “natural” habitats from the entire project study area and is not depicted in the habitat classifications figure legends.

### 3.1.2 Essential Fish Habitat

The areas of Essential Fish Habitat (EFH) were approximated using wetland delineations to determine the estuarine boundary and the most recent publicly available aerial imagery to determine habitat types (Figure 3.2). Additionally, aquatic species that utilize these habitat types were determined using the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) EFH mapper for the Habitat Areas of Particular Concern (HAPC), Atlantic Highly Migratory Species (HMS), and the South Atlantic EFH species.<sup>10</sup> Additional details related to EFH are included in the attached Natural Resources Survey Results document.

Figure 3.2: Essential Fish Habitat Types



Source: Study Team Natural Resources Field Survey (2019)

<sup>10</sup> National Oceanic and Atmospheric Administration. (2018). Essential Fish Habitat Consultations in the Southeast. Southeast Region – Habitat Conservation Division. Accessed February 15, 2021. Retrieved from <https://www.fisheries.noaa.gov/southeast/consultations/essential-fish-habitat-consultations-southeast>.

Essential Fish Habitat (EFH) is the aquatic habitat required for marine species to spawn, breed, feed, and grow to maturity.<sup>11</sup> EFH and managed marine species are under the jurisdiction of the NOAA Fisheries. They must be consulted before construction activities can begin. Several EFH types are found within the project corridor associated with the Cooper and Wando River systems. These types include estuarine emergent wetland, oyster reef and shell, unconsolidated bottom, sub/intertidal flat, and tidal creek (SAFMC 2009). The estimated area of each EFH type is listed in Table 3.2.

**Table 3.2: EFH Types and Approximate Area of Coverage**

| EFH Type                   | Area (acres) | Percentage of EFH in I-526 LCC EAST Corridor |
|----------------------------|--------------|----------------------------------------------|
| Estuarine emergent wetland | 214.3        | 73.4%                                        |
| Oyster shell               | 0.5          | 0.2%                                         |
| Sub/intertidal flat        | 1.3          | 0.4%                                         |
| Tidal creek                | 6.8          | 2.3%                                         |
| Unconsolidated bottom      | 69           | 23.6%                                        |

Source: Study Team Natural Resources Field Survey (March 2020)

Oyster reefs and shells consist of both live beds and non-live oyster washes and are considered an HAPC. Oysters establish live beds on hard surfaces and substrate.<sup>12</sup> This habitat type is not common within the corridor, likely because of a lack of hard surfaces. Oysters grow on most concrete or metal structures within the intertidal zone. Oysters were observed on existing bridge piles in saline habitats throughout the corridor.

Sub/intertidal flats consist of large expanses of flat or nearly flat areas of sediment. Subtidal flats are not exposed at low tide. Intertidal flats constitute areas of settled sediment, which are exposed between high and low tide. These habitats are not common within the corridor. The flats are frequently inhabited by polychaetes, mollusks, and flat fishes such as flounder.

Tidal creeks are made up of the water column and the sediment that has settled to the bottom of the column within the tributaries of the main channel. The water column allows for the movement of larger organisms and habitat for plankton. Tidal creeks allow for the upstream travel of spawning fish; protect juvenile organisms; and provide habitat for shellfish, fish, and mollusks.

Unconsolidated bottom refers to the water column and settled sediment within the main channel. The sediment at the bottom of the channel is primarily inhabited by a variety of invertebrates that are important food for marine species. The Cooper River, Wando River, and Clouter Creek are unconsolidated bottom habitat and are considered HAPC coastal inlets.

The species that use EFH were determined using National Oceanic and Atmospheric Administration (NOAA) GIS data (Table 3.3). HAPC are subsets of EFH that provide important function or are vulnerable to degradation, but they are not provided additional protection.<sup>13</sup> The South Atlantic EFH species

<sup>11</sup> National Oceanic and Atmospheric Administration. (2019). Habitat Conservation Essential Fish Habitat. Accessed February 15, 2021. Retrieved from <https://www.fisheries.noaa.gov/national/habitat-conservation/essential-fish-habitat#essentially-fish-habitat>.

<sup>12</sup> National Oceanic and Atmospheric Administration. (2020). Habitat Conservation-Oyster Reef Habitat. Accessed February 15, 2021. Retrieved from <https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat>.

<sup>13</sup> National Oceanic and Atmospheric Administration. (2018). Essential Fish Habitat Consultations in the Southeast. Southeast Region – Habitat Conservation Division. Accessed February 15, 2021. Retrieved from <https://www.fisheries.noaa.gov/southeast/consultations/essential-fish-habitat-consultations-southeast>.

includes hundreds of managed commercial and recreational marine species and Atlantic highly migratory species such as larger sport fish.<sup>14</sup>

**Table 3.3: Species Within the EFH Habitat Types Identified**

| EFH Species                                                                    |                                                                                |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| HAPC                                                                           |                                                                                |
| Penaeid shrimp<br>( <i>Penaeidae</i> )                                         | Snapper ( <i>Lutjanidae</i> ) –<br>Grouper ( <i>Epinephelinae</i> )<br>complex |
| Atlantic highly migratory species                                              |                                                                                |
| Blacktip shark<br>( <i>Carcharhinus limbatus</i> )                             | Scalloped hammerhead shark<br>( <i>Sphyrna lewini</i> )                        |
| Spinner shark<br>( <i>Carcharhinus brevipinna</i> )                            | Tiger shark<br>( <i>Galeocerdo cuvier</i> )                                    |
| Mid/South Atlantic EFH                                                         |                                                                                |
| Snapper ( <i>Lutjanidae</i> ) –<br>Grouper ( <i>Epinephelinae</i> )<br>complex | Bluefish<br>( <i>Pomatomus saltatrix</i> )                                     |
| Summer flounder<br>( <i>Paralichthys dentatus</i> )                            |                                                                                |

Source: Study Team Natural Resources Field Survey (March 2020)

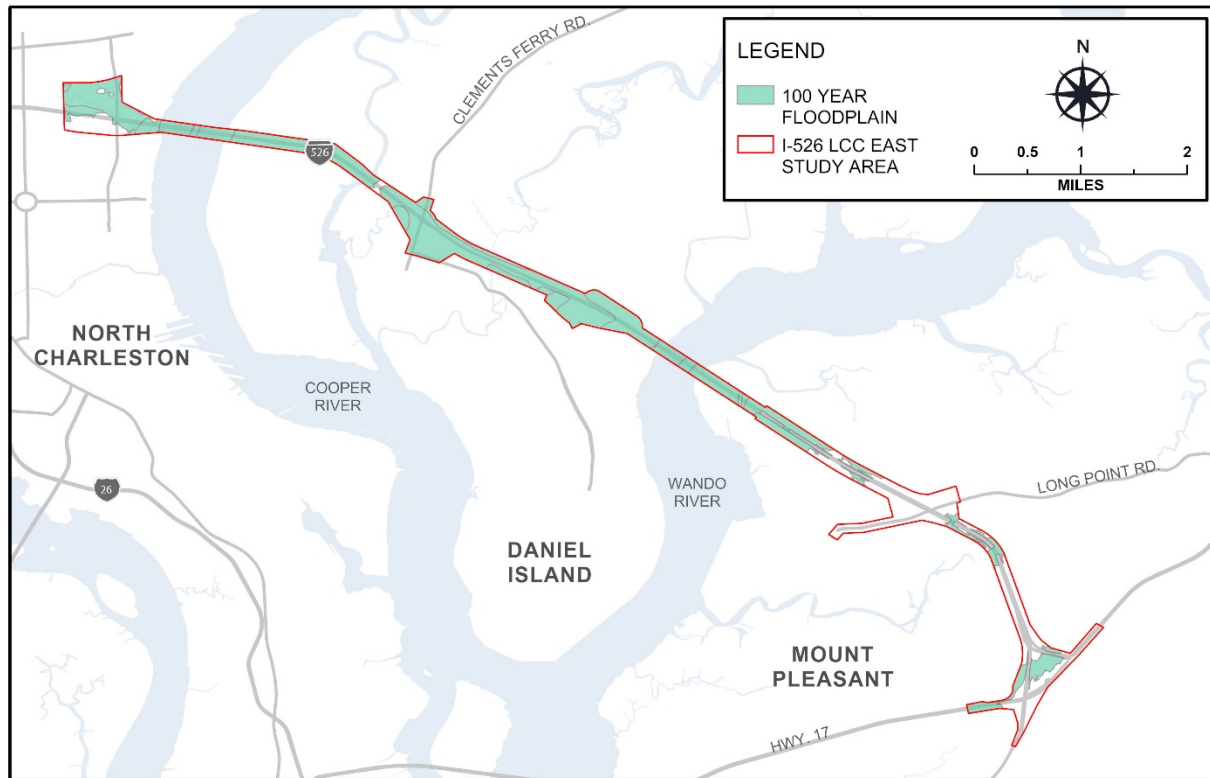
## 3.2 FLOODPLAINS

The Federal Emergency Management Administration (FEMA) identifies Special Flood Hazard Areas (SFHAs). SFHAs are defined as the areas that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1 to A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1 to V30. Moderate flood hazard areas are labeled Zone B or Zone X. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent annual chance flood, are labeled Zone C or Zone X.

Most of the corridor traverses 100-year flood zones (Figure 3.3); however, most of the existing I-526 is elevated bridge structure. The corridor is primarily located within a 100-year flood zone (1 percent annual chance of flood) from Virginia Avenue in North Charleston to Stonewall Court in Mount Pleasant. The corridor is in the 500-year flood zone (0.2 percent annual chance of flood) in North Charleston south of I-526, in Mount Pleasant from Stonewall Court to Belle Pointe Drive, in Mount Pleasant from Wakendaw Road to Hospital Drive, and in Mount Pleasant on U.S. 17 from the I-526 off ramp to Mathis Ferry Road. If proposed cuts and fills are identified in the floodplains, a Conditional Letter of Map Revision (CLOMR) from the Federal Emergency Management Administration (FEMA) will be required.

<sup>14</sup> National Oceanic and Atmospheric Administration. (2018). Essential Fish Habitat Consultations in the Southeast. Southeast Region – Habitat Conservation Division. Accessed February 15, 2021. Retrieved from <https://www.fisheries.noaa.gov/southeast/consultations/essential-fish-habitat-consultations-southeast>.

Figure 3.3: Floodplains



Source: FEMA Special Flood Hazard Areas (2018)

### 3.3 PROTECTED SPECIES

The study team habitat surveys targeting protected species in Charleston and Berkeley counties were conducted between August 2018 and September 2019. The surveys were conducted within the project study area.

The U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries are responsible for the enforcement of federal wildlife laws and the protection of endangered species. They should be consulted before the proposed project begins. There are 25 protected species listed in Berkeley and Charleston counties. Field reviews and observations determined that 12 species have suitable habitat present within the I-526 LCC East project study area (see Table 3.4).

Species habitat requirements were analyzed to determine if suitable habitat for each species was present within the corridor. Occurrences for the manatee, red-cockaded woodpecker cavities, foraging wood storks, and the bald eagle near the eastern terminus of I-526 LCC EAST project study area were documented during field review. According to records from the South Carolina Department of Natural Resources, the green sea turtle and bald eagle nest along the Wando River. For additional details on protected species within the project study area, reference the attached Natural Resources Survey Results document.



Table 3.4: Protected Species with Suitable Habitat, Their Protected Status, and General Habitat

| Common Name                  | Scientific Name                                | Protected Status                     | Habitat                                                                                    |
|------------------------------|------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Amphibian</b>             |                                                |                                      |                                                                                            |
| Frosted flatwoods salamander | <i>Ambystoma cingulatum</i>                    | Threatened; critical habitat         | Breed in seasonally flooded wetlands in pine flatwoods                                     |
| <b>Bird</b>                  |                                                |                                      |                                                                                            |
| Red knot*                    | <i>Calidris canutus rufa</i>                   | Endangered                           | Feed on sandy beaches and mudflats while migrating                                         |
| Piping plover*               | <i>Charadrius melodus</i>                      | Endangered; critical habitat         | Feed on sandy beaches and mudflats during winter migration                                 |
| Red-cockaded woodpecker      | <i>Picoides borealis</i>                       | Endangered                           | Open understory, living, old growth pine forests                                           |
| Bald eagle                   | <i>Haliaeetus leucocephalus</i>                | Bald and Golden Eagle Protection Act | Nests in tall trees less than 0.5 miles from large waterbody, forages in large waterbodies |
| Eastern black rail*          | <i>Laterallus jamaicensis ssp. jamaicensis</i> | Threatened                           | Shallow emergent wetlands                                                                  |
| Wood stork                   | <i>Mycteria americana</i>                      | Threatened                           | Shallow water for foraging; freshwater wetlands for nesting                                |
| <b>Fish</b>                  |                                                |                                      |                                                                                            |
| Atlantic sturgeon            | <i>Acipenser oxyrinchus</i>                    | Endangered; critical habitat         | Cooper River is critical habitat; spawn upriver                                            |
| Shortnose sturgeon           | <i>Acipenser brevirostrum</i>                  | Endangered                           | Spawn in freshwater, live in coastal waters                                                |
| <b>Mammal</b>                |                                                |                                      |                                                                                            |
| Northern long-eared bat      | <i>Myotis septentrionalis</i>                  | Threatened                           | Summer maternity roosts in trees, overwinter in caves and mines                            |
| West Indian manatee          | <i>Trichechus manatus</i>                      | Threatened                           | Feeds on aquatic vegetation in coastal waters, migrates to Florida for winter              |
| <b>Reptile</b>               |                                                |                                      |                                                                                            |
| Green sea turtle*            | <i>Chelonia mydas</i>                          | Threatened                           | Nests on oceanfront beaches, forages in coastal rivers                                     |

\*Listed in Charleston County; not listed in Berkeley County.

Source: Study Team Natural Resources Field Survey (March 2019)

### 3.4 FARMLANDS

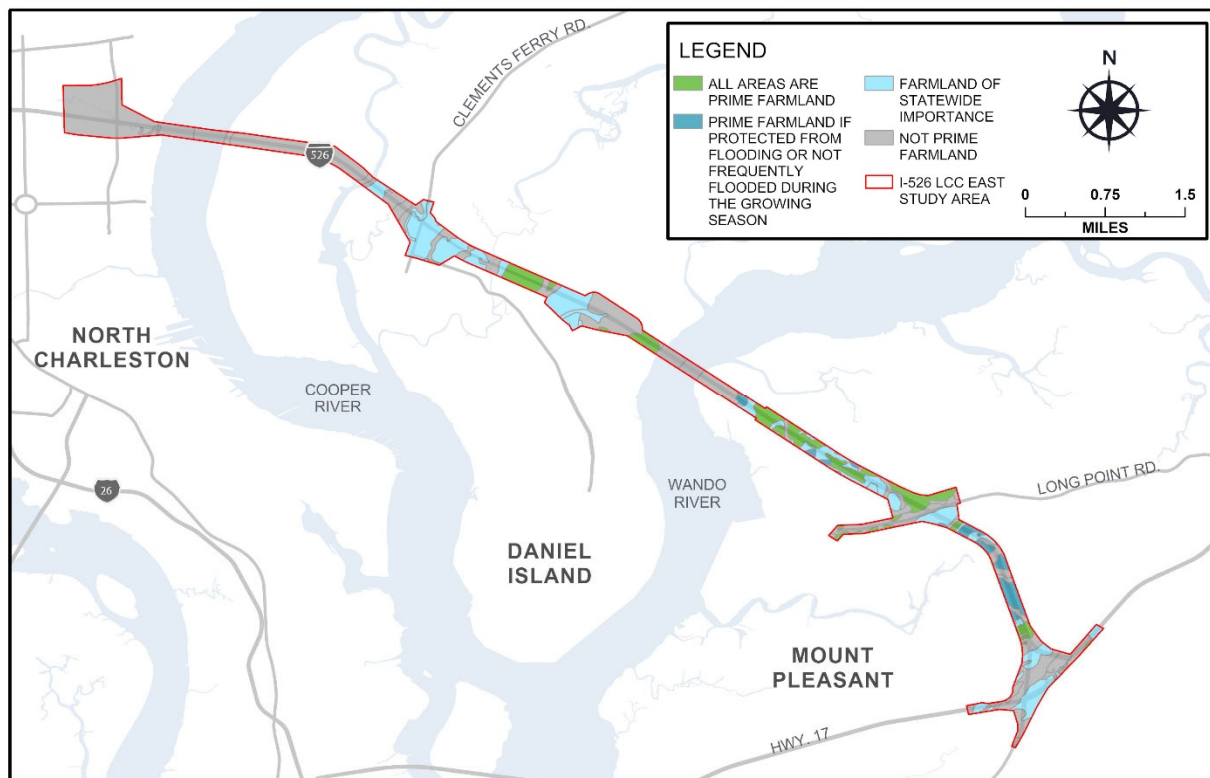
All farmland classifications were determined within the I-526 LCC EAST project study area from soil data collected from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Several USDA NRCS farmland classifications are present within the I-526 LCC EAST project study area. Farmlands by classification are shown in Table 3.5 and mapped in Figure 3.4.

Table 3.5: Farmland Classification for I-526 LCC EAST Corridor

| Farmland Classification                                                                       | Acres |
|-----------------------------------------------------------------------------------------------|-------|
| All areas are prime farmland                                                                  | 895   |
| Farmland of statewide importance                                                              | 2,309 |
| Prime farmland if protected from flooding or not frequently flooded during the growing season | 769   |
| Not prime farmland                                                                            | 9,664 |

Source: USDA NRCS, 2019

Figure 3.4: Farmlands



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Source: U.S. Department of Agriculture Natural Resources Conservation Service (2019)

### 3.5 AIR QUALITY

The I-526 LCC EAST project study area is located in Charleston and Berkeley counties. Both Charleston and Berkeley counties are National Ambient Air Quality Standards attainment areas. As a result, detailed air quality modeling will not be required for this project in the NEPA documentation.

### 3.6 HAZARDOUS MATERIAL SITES

An Environmental Record Search report was compiled for the I-526 LCC EAST project study area to determine hazardous materials sites within the I-526 LCC EAST project study area. In total, 82 records were identified for hazardous materials sites within the I-526 LCC EAST project study area.

In North Charleston, the following records were identified for sites within the I-526 LCC EAST project study area:

- Two air permit (Air-Active-SC) facilities
- Four National Response Center discharge locations (ERNS-US)
- Nine sites on the Facility Registry System (FRS-US) list
- One site on the groundwater contamination inventory (GWCI-SC) database
- Four sites on the historical Air Facility System (Hist-AFS-US) list
- Three historical aboveground storage tanks (Hist-AST-US)
- One historical state Comprehensive Environmental Response, Compensation, and Liability Act (Hist-CERCLA-SC) site
- Two sites on the historical facility index system (Hist-FINDS-US)
- One historically formally utilized defense sites (Hist-FUDS-SC)
- One historical U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (Hist-RCRIS-US) site
- One historical rental equipment and yard (Hist-Rental)
- 23 previously listed South Carolina (Hist-SC) sites
- Three historical state sites (Hist-SS-SC)
- Two historical transportation (Hist-Transportation) facilities
- 11 historical trucking, shipping, delivery, and/or storage (Hist-Trucking) sites
- Five historical previously listed federal sites (Hist-US)
- One historical underground storage tank (Hist-UST)
- One site on the historical Underground Storage Tank Data Management System (Hist-UST2)
- One site on the Integrated Compliance Information System for Air (ICIS-Air-US)
- 10 sites on the Integrated Compliance Information System for Federal Enforcement Data (ICIS-FEC-US) list
- One National Pollutant Discharge Elimination System (ICIS-NPDES-US) site
- One Resource Conservation and Recovery Act conditionally exempt small quantity generators (RCRA CESQG) site
- One Resource Conservation and Recovery Act large quantity generators (RCRA LQG) site
- Three Resource Conservation and Recovery Act non-hazardous generators (RCRA Non-Haz) sites
- One Resource Conservation and Recovery Act small quantity generators (RCRA SQG) site
- Two risk management plan (RMP-US) sites
- One site assessment section project list (SASPL) site
- Seven South Carolina spills reports (Spills-SC) sites
- One historical state contaminated (SS-SC) site
- One historical Toxics Release Inventory system (TRIS2000-US) site
- One Toxics Release Inventory system (TRIS2010-US) site
- One historical Toxics Release Inventory system (TRIS80-US) site
- One historical Toxics Release Inventory system (TRIS90-US) site
- Three Toxic Substances Control sites (TSCA-US)
- Two underground storage tanks (UST-SC)

No hazardous materials sites were identified from the Environmental Record Search report for Daniel Island.

In Mount Pleasant, the following records were identified for sites within the I-526 LCC EAST project study area from the Environmental Record Search report:

- One air permit facility (Air-Active-SC)
- One Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS-US) site
- Three dry cleaners (Cleaners-SC)
- Two Dry Cleaning Trust Fund (DCTF-SC) sites
- Two dry cleaning facilities (DryCleaners-SC)
- Two enforcement actions (ENF-SC) sites
- One National Response Center discharge location (ERNS-US)
- Three financial assurance, underground storage tank (FA-UST-SC) sites
- 29 Facility Registry Index (FRS-US) sites
- Two historical air facility system for Clean Air Act stationary sources (HIST-AFS-US)
- Four historical auto and truck dealers (Hist-Auto Dealers)
- Nine historical automotive repair (Hist-Auto Repair) sites
- One historical chemical/hazardous use storage (Hist-Chemical-Storage) site
- One historical manufacturing and distribution of chemicals, gases, and/or solids (Hist-Chemical Manufacturing) site
- Three historical laundry, cleaners, and dry cleaning services (Hist-Cleaners) sites
- One historical convenience store with possible gas (Hist-Convenience) site
- Two historical dry cleaner facilities (Hist-DryCleaners-SC) sites
- Six historical facility index system (Hist-FINDS-US) sites
- One historical leaking underground storage tank (HIST-LUST-SC) site
- One historical leaking underground storage tank database (Hist-LUST2-SC) site
- One historical machine shops, welding, machine repair (Hist-Machine Shop) site
- Four historical sources U.S. manufacturing (Hist-Manufacturing) sites
- One historical printers and publishers (Hist-Printers) site
- One historical EPA's Resource Conservation and Recovery Act (Hist-RCRIS-US) site
- Two historical rental equipment and yards (Hist-Rental) site
- One historical trailer and recreational vehicle dealers (Hist-RV-Dealers) site
- One historical vehicle salvage yards or wreckers (Hist-Salvage) site
- 65 previously listed South Carolina sites (Hist-SC)
- Three historical service stations/vehicle fueling (Hist-Service Stations) sites
- Five historical trucking, shipping, delivery, and/or storage (Hist-Trucking) sites
- Three historical previously listed federal sites (Hist-US)
- Six historical underground storage tanks (HIST-UST-SC)
- Three historical Underground Storage Tank Data Management System (Hist-UST2-SC) sites
- Six historical vehicle parts (Hist-Vehicle-Parts) sites
- One Integrated Compliance Information System for Air (ICIS-Air-US)
- One National Pollutant Discharge Elimination System (ICIS-NPDES-US) site
- 13 infectious waste generator facilities (IWG-SC)
- Three leaking underground storage tanks, closed cases (LUST-Closed-SC) sites



- Two Resource Conservation and Recovery Act conditionally exempt small quantity generators (RCRA-CESQG-US)
- 10 Resource Conservation and Recovery Act, non-hazardous generators (RCRA-NON-US)
- Two Resource Conservation and Recovery Act, small quantity generators (RCRA SQG)
- Three site assessment section project list (SASPL-SC) sites
- One Safe Drinking Water Information System (SDWIS-US) site
- Four South Carolina spills report (Spills-SC) sites
- One historical state contaminated site (SS-SC)
- One solid waste facilities list (SWF-SC) site
- Eight underground storage tanks (UST-SC)

## 4.0 CULTURAL RESOURCES

Cultural resources are identified as archaeological and architectural resources. The study team attempted to locate and assess the significance of all cultural resources that may be directly or indirectly affected by the I-526 LCC EAST project. Background research, an archaeological and architectural survey, laboratory analyses, and an NRHP assessment were conducted. The Area of Potential Effect (APE) is the study area for the assessment of cultural resources, including the archaeological and architectural survey boundaries. The APE encompasses a 91 meter (about 300 foot) buffer around the project study area. Archaeological resources were surveyed within the project study area, and architectural resources were surveyed to the 91 meter buffer around the study area.

Cultural resources were identified from archaeological and architectural surveys conducted by the study team in 2018 and the SCArchSite, which is an online cultural resource information system for the state of South Carolina maintained by the South Carolina Institute of Archaeology and Anthropology and the South Carolina Department of Archives and History.

A total of 36 archaeological resources were identified in the APE. The 36 archaeological resources identified include 30 previously recorded resources and six newly recorded resources within the National Register of Historic Places (NRHP). Five of the 30 previously recorded resources are NRHP-listed or NRHP-eligible resources, and two of the 30 resources are cemeteries. Adverse effects to the five resources that are NRHP-listed or -eligible resources have been avoided and do not require any further management.

The architectural survey found a total of 15 aboveground resources in the APE, including 12 architectural resources, two cemeteries, and one traditional cultural property (TCP) (Sweetgrass Basket Stand Corridor TCP). The two cemeteries are not eligible for NRHP but are protected from disturbance and desecration under South Carolina state law (South Carolina Code of Laws 16-17-600). One resource is a contributing element of the NRHP-listed Snowden Community Historic District and is identified as Long Point School (7802). It is a contributing element of the Snowden Community Historic District. A movement was initiated to save the school and relocate the structure to be restored and preserved for posterity. All concept options have avoided impact to this facility. The school was lifted off its foundation for relocation in early 2020; however, permits and consensus among the stakeholders has postponed its relocation. The Sweetgrass Basket Stand Corridor TCP no longer retains integrity, and therefore the project will not have an adverse effect on the property. The remaining 10 aboveground resources are not eligible for NRHP.

The New Hope Church Cemetery and an African American cemetery (38CH319) are located within the APE. The New Hope Church Cemetery is located at northern ramps of I-526 and U.S. 17 north of John Dilligard Lane. Site 38CH319 is an early- to mid-twentieth century African American cemetery. The cemetery is not eligible but is protected. The cemetery is located north of Long Point Road.

If a historic district or property is impacted, consultation with the State Historic Preservation Office is required for Section 106 impacts. The NEPA process must provide a Section 106 concurrence for impacts to historic districts or properties.

## 5.0 LIST OF ENVIRONMENTAL LAWS AND REGULATIONS

The following environmental laws and regulations are applicable to additional NEPA studies for the I-526 LCC EAST project.

### 5.1 FEDERAL LAWS

- Archaeological and Historic Data Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93-291, 16 U.S.C. 469)
- Clean Air Act (as amended by P.L. 91-604)
- Coastal Barrier Resources Act of 1982 (P.L. 97-348; 16 U.S.C. 3501-3510)
- Coastal Zone Management Act of 1972 (P.L. 92-583; 16 U.S.C. 1451-1464)
- Community Environmental Response Facilitation Act of 1992 (P.L. 102-426; 42 U.S.C. 9601 et seq.)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (P.L. 96-510; 42 U.S.C. 9601 et seq.)
- Department of Transportation Act (49 U.S.C. 101 et seq.)
- Endangered Species Act of 1973 (P.L. 93-205; 16 U.S.C. 1531 [a-d])
- Farmland Protection Policy Act (P.L. 97-98; 7 USC 4201 et seq.)
- Federal Land Policy and Management Act of 1976 (P.L. 97-579; 43 U.S.C. 1701 et seq.)
- Federal Water Pollution Control Act Amendments for 1972 (P.L. 92-500; 33 U.S.C. 1344), as amended by the Clean Water Act of 1977 (P.L. 95-217; 33 U.S.C. 1251 et seq.)
- Fish and Wildlife Act of 1956 (16 U.S.C. 7421 et seq.)
- Fish and Wildlife Coordination Act (16 U.S.C. 661-666c)
- Homeland Security Act of 2002
- Magnuson-Stevens Fishery Conservation Management (P.L. 94-265; 16 U.S.C. 1801 et seq.)
- Migratory Marine Game-Fish Act (16 U.S.C. 760 (c-g))
- National Environmental Policy Act of 1969 (Public Law [P.L.] 91-190; 42 United States Code [U.S.C.] 4321)
- Noise Control Act of 1972 (P.L. 92-574; 42 U.S.C. 4901)
- Resource Conservation and Recovery Act of 1976 (P.L. 94-580; 42 U.S.C. 6901 et seq., as amended by the Solid Waste Disposal Act of 1980 (P.L. 96-482), and the 1984 Hazardous and Solid Waste Amendments (P.L. 98-616))
- Rivers and Harbors Act of 1899 (33 U.S.C. 403)
- Section 106, National Historic Preservation Act of 1966 (P.L. 89-665; 16 U.S.C. 470[f])
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-528; 42 U.S.C. 4601)
- Water Bank Act (P.L. 91-559; 16 U.S.C. 1301)
- Wild and Scenic Rivers Act (16 U.S.C. 1279 et seq.)

## 5.2 FEDERAL REGULATIONS/FEDERAL REGISTER

- 7 Code of Federal Regulations (CFR) 657 (43 Federal Register [FR] 4030, January 31, 1978) USDA, Prime and Unique Farmlands
- 23 CFR 771 FHWA, Environmental Impact and Related Procedures
- 23 CFR 772 FHWA, Procedures for Abatement of Highway Noise
- 23 CFR 774 USDOT, Section 4(f): Parks, Recreational Areas, Wildlife and Waterfowl Refuges, and Historic Sites
- 33 CFR 1–200 U.S. Coast Guard, Department of Homeland Security
- 33 CFR 320–332 USACE, General Regulatory Policies
- 36 CFR 800, Implementing Regulations for the National Historic Preservation Act
- 40 CFR 220 EPA, Ocean Dumping
- 40 CFR 230 EPA, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material
- 40 CFR 1500–1508 Council on Environmental Quality, Implementing Regulations for NEPA
- 49 CFR 24 USDOT, Uniform Relocation and Real Property Acquisition for Federal and Federally Assisted Programs

## 5.3 PRESIDENTIAL EXECUTIVE ORDERS

- Executive Order 11296, Flood Hazard Evaluation Guidelines
- Executive Order 11514, Protection and Enhancement of Environmental Quality, March 4, 1970
- Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971
- Executive Order 11988, Floodplain Management (43 FR 6030)
- Executive Order 11990, Protection of Wetlands
- Executive Order 12372, Intergovernmental Review of Federal Programs, July 14, 1982
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994
- Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks

## 5.4 SOUTH CAROLINA STATUTES AND REGULATIONS

- Coastal Tidelands and Wetlands Act (South Carolina Code of Laws [SC Code] Annotated [Ann.] Section 48-39-10 et seq.)
- SCDHEC Classified Waters R. 61–69, 1976 SC Code Ann., as amended
- SCDHEC Water Classifications and Standards R. 61-68, 1976 SC Code Ann., as amended
- South Carolina Coastal Zone Management Act, 1972
- South Carolina Coastal Zone Management Program (1976, as amended)
- South Carolina Department of Health and Environmental Control (SCDHEC)/Ocean & Coastal Resource Management (OCRM) Rules and Regulations for Permitting in the Critical Areas of the Coastal Zone, R. 30-1, et seq., 1976 SC Code
- Standards for Stormwater Management and Sediment Reduction (R. 72-300–72-316)
- Stormwater Management and Sediment Reduction Act (SC Code Ann. Section 48-14-10 et seq.)
- Water Classifications and Standards (R. 61–68)

- Water Quality Certification SCDHEC 401 Water Quality Certification Regulations, R. 61–101, 1976 SC Code Ann., as amended

## 5.5 MEMORANDA OF UNDERSTANDING/MEMORANDA OF AGREEMENT<sup>15</sup>

### 5.5.1 Alternatives Analysis and Mitigation

- Memorandum of Agreement (MOA) Between EPA and the Department of the Army Concerning the Determination on of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines, February 6, 1990
- Memorandum to the Field: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements (EPA, U.S. Department of Defense, USACE), August 23, 1993
- Memorandum for the Field: Individual Permit Flexibility for Small Landowners (U.S. Department of Defense), March 6, 1995 Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (Federal Register, November 28, 1995; Volume 60, Number 228), Page 58605-58614) (Agencies: USACE, EPA, NRCS, USFWS, NOAA Fisheries)

### 5.5.2 Compliance/Enforcement

- MOA Between the Department of the Army and EPA Concerning Federal Enforcement for the Section 404 Program of the Clean Water Act, January 19, 1989
- Section 404 MOA Procedures Regarding the Applicability of Previously Issued Corps Permits, January 19, 1989
- Guidance on Judicial Civil and Criminal Enforcement Priorities, December 12, 1990

Coordination between USACE and EPA on Enforcement of Section 404 of the Clean Water Act (CWA), December 3, 2012

<sup>15</sup> U.S. Army Corps of Engineers. Memorandum of Understanding/Agreement. Accessed February 15, 2021. Retrieved from <https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/MOU-MOAs/>.