



ENVIRONMENTAL JUSTICE REPORT

Biogas Digester General Permit Development

North Carolina Department of Environmental Quality
6/30/2022

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1 Introduction

In July of 2021, the North Carolina General Assembly passed the Farm Act of 2021, Session Law 2021 - 78. Section 11 of the legislation required the North Carolina Department of Environmental Quality (NCDEQ or Department) to develop a General Permit for facilities that construct and operate a farm digester system. This analysis will evaluate the three types of general permits separately: Swine, Cattle, and Poultry with a Liquid Waste Management System (Wet Poultry.)

Animal operations are defined by General Statute 143-215.10B as feedlots involving more than 250 swine, 100 confined cattle, 75 horses, 1,000 sheep, or 30,000 poultry with a liquid waste management system. The general permits contain the required performance standards, operation and maintenance requirements, monitoring and reporting requirements, policy for inspections and entry to the farms, general conditions and the penalty policy. Each general permit is issued with a Certificate of Coverage that is permittee-specific and designates the permitted number and type of animals.

Based on the goal and scope of this analysis, several methodologies were considered which built upon a previously conducted, smaller scale community analysis which focused exclusively on swine AFOs. All of the methodologies used steady state live weight (SSLW), or the number of animal feeding operations (AFO), combined with proximity either to land or people to determine where (based on permitted facility reporting), the greatest number of animals are likely located near the greatest number of people.

It is important to note that this is an analysis of the facilities with current 2019 general permits and it is not anticipated that every facility covered under the 2019 general permits will apply for the new digester general permits. Additionally, the new digester general permits will replace the existing general permits only if the facility applies for the digester general permit. As it is not possible to predict which facilities will install digesters under the new general permits, this analysis relies on general information and is not a site-specific examination.

2 Methodology

Previously, NCDEQ developed five potential methods from which to select the communities with the highest potential exposure to AFOs (See Table 1). In most methods, SSLW was used as the indicator, assuming that higher SSLW values result in the generation of more waste. Higher amounts of waste may lead to externalities typically reported as complaints associated with facility operations (i.e. odor).

Using the fifth methodology outlined below, NCDEQ was able to effectively identify the areas across the state with the highest amount of SSLW per square mile. SSLW was separated out by the type of certificate of coverage: Cattle, Wet Poultry, and Swine. Due to availability of data, only the types of facilities required to have an NCDEQ-issued certificate of coverage under state law were included in this analysis. The 5 counties with the highest SSLW per square mile for each of the three types of coverage were selected for the analysis. Select demographic data was overlaid with the SSLW per square mile across the state at the county and census tract level. The datasets included in this analysis are poverty (Table S1701, American Community Survey 2019 5-year estimates), race and ethnicity (Table P2, 2020 Census), and limited English proficiency; Spanish (Table C16002, American Community Survey 2019 5-year estimates).

Table 1. Potential Methodologies for Analysis

| Method | Description of Methodology |
|--|--|
| <p>Land Proximity by SSLW: This method calculates the locational proximity of all land parcels (regardless of the parcel's use classification) to SSLW</p> | <ol style="list-style-type: none"> 1) A 2km buffer was placed around each COC 2) All land parcels within 2km of a COC were assigned the SSLW value of that COC. If a land parcel was proximate to more than one COC, the parcel was assigned the total SSLW from all COCs within 2km |
| <p>Number of Residential Parcels Within 2km of a Swine State COC Per Census Tract: This method calculates the number of parcels in each Census Tract that are within 2km of a COC, without factoring SSLW</p> | <ol style="list-style-type: none"> 1) Residential parcels were selected from county parcel data, and any residential parcels within 2km of a COC were selected 2) The residential parcels were joined to the census tract to calculate the number of residential parcels within each census tract that were located proximate to at least one COC |
| <p>Average SSLW Near Residential Parcels: This method calculates the average SSLW of residential parcels located within 2km of a COC in each Census Tract</p> | <ol style="list-style-type: none"> 1) Residential parcels were selected from county parcel data 2) Each residential parcel was assigned the SSLW amount of SSLW of each COC located within 2km of the parcel 3) To compare census tracts across the counties, the SSLW values assigned to each residential parcel within each census tract were averaged across the entire tract to produce a single number per census tract. |
| <p>Overall SSLW: This method calculates the value of SSLW per Census Tract</p> | <ol style="list-style-type: none"> 1) The total SSLW value of every COC would be calculated |
| <p>Pounds of SSLW/Square Mile: This method calculates pounds of SSLW per square mile per Census Tract</p> | <ol style="list-style-type: none"> 1) The total SSLW value of every State COC located within each census tract in the state was calculated 2) This total number was divided by square miles per census tract 3) The 5 counties with the highest values of SSLW per square mile were included in the analysis, separated by type of animal. |

3 Environmental Justice Analysis

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (US EPA). The primary goal of this EJ Report is to encourage comments and suggestions from the surrounding community, industry, and environmental groups throughout the comment period. Public comments were considered throughout the comment period prior to publishing the Final EJ Report.

The following components are included within this EJ Report:

- Potentially Underserved Communities as defined by NCDEQ
- Existing locations of biogas digester permits
- Existing general permits SSLW distribution
- Comparison of local area demographics to the county and statewide census data (from the US Census; <https://data.census.gov/cedsci/advanced>)
- Limited English Proficiency
- Tribal Counties
- County Health Rankings

3.1 Potentially Underserved Communities

NCDEQ has selected specific block groups across the state that meet a certain threshold for both race and ethnicity and poverty when compared to the County and State percentages. This is the only portion of the analysis that is on the block group level. Block groups are statistical divisions of census tracts, are generally defined to contain between 600 and 3,000 people and are used to present data and control block numbering. A block group consists of clusters of blocks within the same census tract that have the same first digit of their four-digit census block number (US Census Bureau).

NCDEQ defines potentially Underserved Communities by examining the Race/Ethnicity and Poverty criteria of each block group. The block group is then compared to both the County and the State and selected as a potentially underserved block group if it meets the following criteria for Race/Ethnicity and Poverty:

Racial/Ethnic composition:

Share of nonwhites and Hispanic or Latino (of any race) is over fifty percent **OR**

Share of nonwhites and Hispanic or Latino (of any race) is at least ten percent higher than County or State share.

AND

Poverty rate:

Share of population experiencing poverty is over twenty percent **AND**

Share of households in poverty is at least five percent higher than the County or State share.

Approximately 25% of North Carolina's block groups meet this definition of potentially underserved.

This dataset is a selection of the 2019 ACS data from the data tables B03002—Hispanic or Latino Origin by Race—and S1701—Poverty Status in the Past 12 Months. Learn more about [NC DEQ's Potentially Underserved Block Groups 2019 - Overview \(arcgis.com\)](#).

3.2 Existing biogas permits

The NCDEQ has issued 17 individual permits to date for biogas digesters. These are located across 7 counties in North Carolina:

- Bladen
- Duplin
- Harnett
- Sampson
- Johnston
- Wayne
- Yadkin

Of the existing 17 permits, 4 are located within NCDEQ selected potentially underserved block groups (Figure 1).

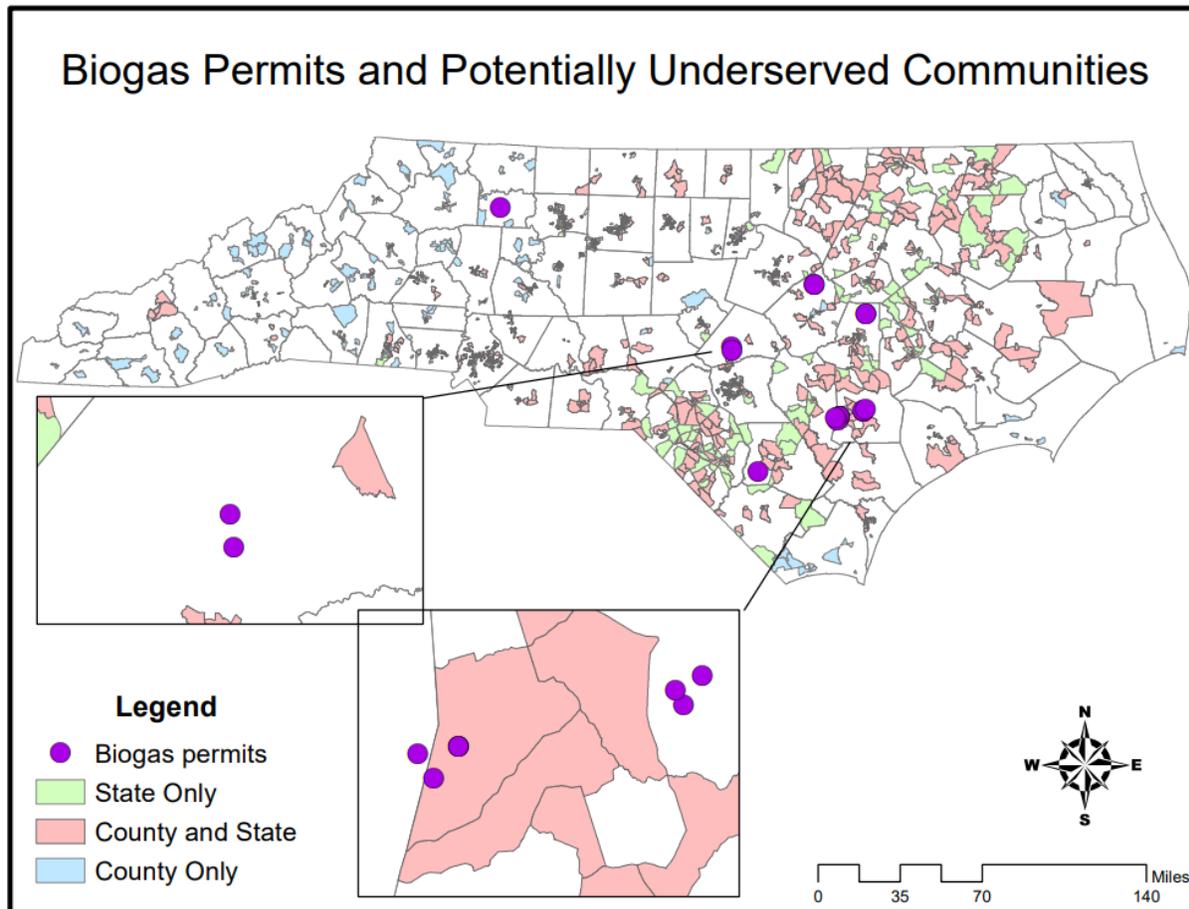


Figure 1. Existing biogas digester permits in North Carolina overlaid with the potentially underserved block group selection.

4 Swine

Across North Carolina, there are 2,161 swine permits covered under the 2019 general permit. The following table (Table 2) outlines the 5 counties in North Carolina that have the highest amount of SSLW per square mile for Swine. Two portions of the analysis are included below. The first portion includes the entire state overlaying the SSLW at the block group level for potentially underserved communities and at the census tract level with Limited English Proficiency for Spanish speakers. The second portion of the analysis is at the census tract level and includes race and ethnicity, and poverty for the top five counties only. For Swine, the certificates of coverage are located across 60 counties.

Table 2. Counties with the highest swine SSLW per square mile

| County | SSLW/Sq mile |
|----------------|--------------|
| Sampson County | 6,421,962.46 |
| Duplin County | 5,876,928.48 |
| Wayne County | 4,169,531.19 |
| Bladen County | 2,206,113.71 |
| Robeson County | 1,734,305.98 |

4.1 Potentially Underserved Communities

The following figure (Figure 2) shows the potentially underserved block group selection overlaid with the swine certificates of coverage averaged out to show SSLW per square mile.

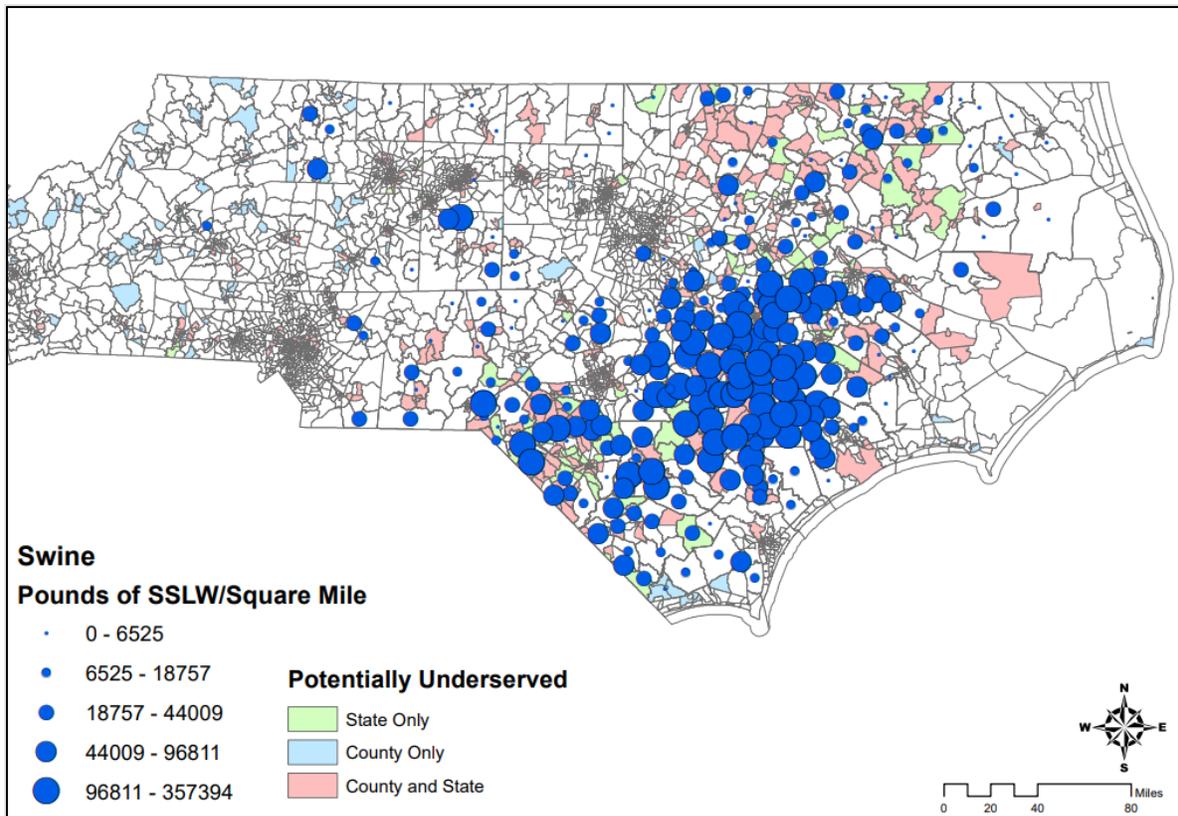


Figure 2. Swine SSLW/Square Mile (census tracts) overlaid with Potentially Underserved Communities (Block Group).

4.2 Limited English Proficiency- Spanish

Per the Safe Harbor Guidelines, should an LEP Group be identified during the permit application process, written translations of vital documents for each eligible LEP language group that constitutes 5% or includes 1,000 members (whichever is less) of the population of persons eligible to be served or likely to be affected or encountered. If there are fewer than 50 persons in a language group that reaches the 5% trigger, then NCDEQ will not translate vital written materials, but instead will provide written notice in the primary language of the LEP language group of the right to receive competent oral interpretation of those written materials, free of cost. The safe harbor provisions apply to the translation of written documents only. Safe harbor guidelines are based on EPA guidance for LEP persons and implemented by NCDEQ when deemed appropriate.

The following figure (Figure 3) shows the census tracts across North Carolina with a population who speaks English less than very well for Spanish greater than 5% and the Swine SSLW per square mile.

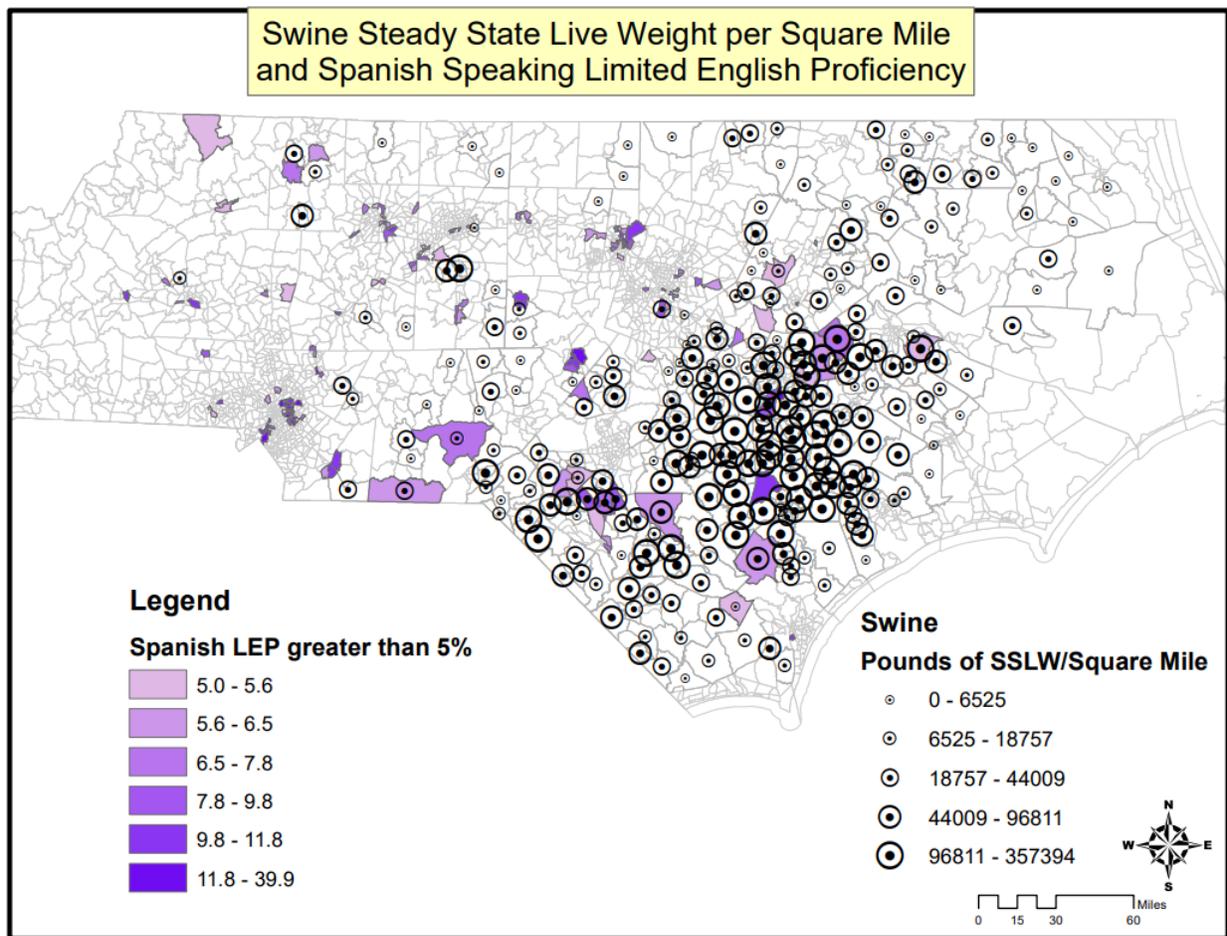


Figure 3. Census tracts with Spanish speaking populations who speak English less than very well and SSLW averages for swine.

4.3 Five County Analysis

Using standard environmental justice guidelines from the EPA and NEPA documentation, the following conditions will be flagged as communities with the potential for having environmental justice concerns:

1. 10% or more in comparison to the county or state average
2. 50% or more minority
3. 5% or more in comparison to the county or state average for poverty

For example, if a census tract has 35% of the population classified as low income but the county consists of 30% low income, the census tract would exceed the county average by 16.7% and thus be flagged as an area with the potential for having EJ concerns. 2020 Census Bureau data is real data gathered every ten years, whereas the estimates from the more recent years are modeled based on the real data.

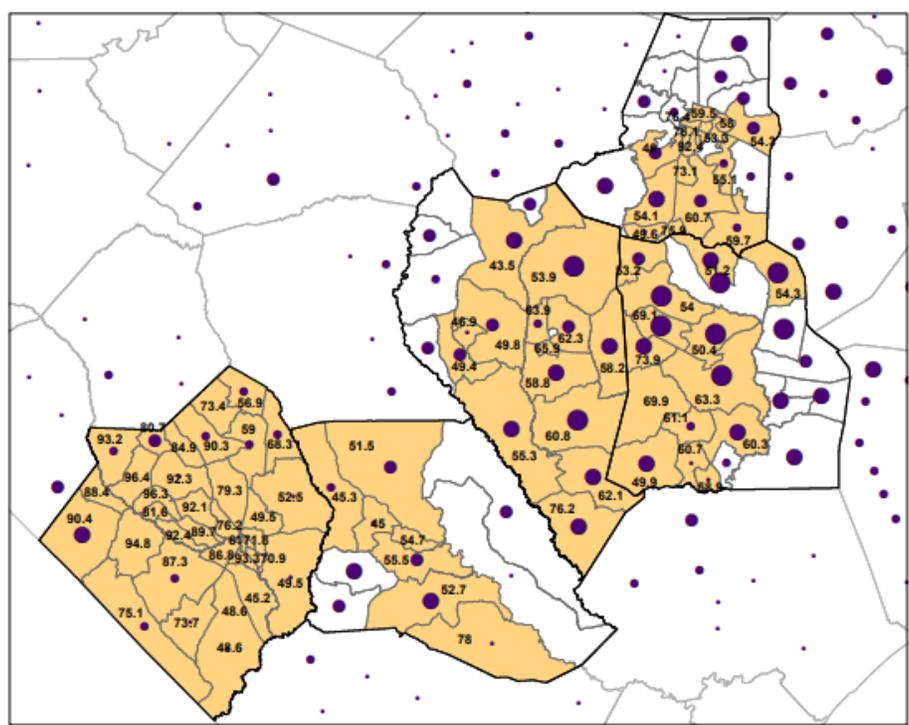
Race and Ethnicity

The following maps show the top 5 counties as ranked by the SSLW per square mile. This was calculated on the census tract level and summed up to the county level. All census tracts that are flagged in comparison to either the state or county as laid out above are highlighted in yellow in the maps. Table 3 shows the 2020 Census data for the 5 counties and North Carolina.

Table 3. Race and ethnicity for the five counties with the highest SSLW per Square mile for swine and North Carolina

| Geography | Total Population | Hispanic or Latino | White | Percent Nonwhite and Hispanic or Latino | Black or African American | American Indian or Alaska Native | Asian | Native Hawaiian or Pacific Islander | Some other Race | Two or more Races |
|------------------|-------------------------|---------------------------|--------------|--|----------------------------------|---|--------------|--|------------------------|--------------------------|
| North Carolina | 10,439,388 | 1,118,596 | 6,312,148 | 39.5% | 2,107,526 | 100,886 | 340,059 | 6,980 | 46,340 | 406,853 |
| Bladen County | 29,606 | 2,546 | 15,830 | 46.5% | 9,505 | 701 | 47 | 8 | 67 | 902 |
| Duplin County | 48,715 | 10,813 | 24,945 | 48.8% | 11,437 | 154 | 155 | 4 | 120 | 1,087 |
| Robeson County | 116,530 | 11,757 | 29,159 | 75.0% | 26,218 | 43,536 | 897 | 63 | 411 | 4,489 |
| Sampson County | 59,036 | 12,249 | 29,729 | 49.6% | 13,944 | 1002 | 216 | 18 | 156 | 1,722 |
| Wayne County | 117,333 | 14,927 | 60,199 | 48.7% | 35,329 | 335 | 1,542 | 71 | 454 | 4,476 |

**Race and Ethnicity
and Swine in Wayne, Duplin,
Sampson, Bladen and Robeson County, NC**



Legend

Non White Hispanic and Latino 10% or Greater Than County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 0 - 34556
- 34556 - 83314
- 83314 - 148619
- 148619 - 240923
- 240923 - 357394

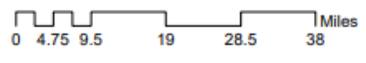


Figure 4. Map of the 5 counties flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

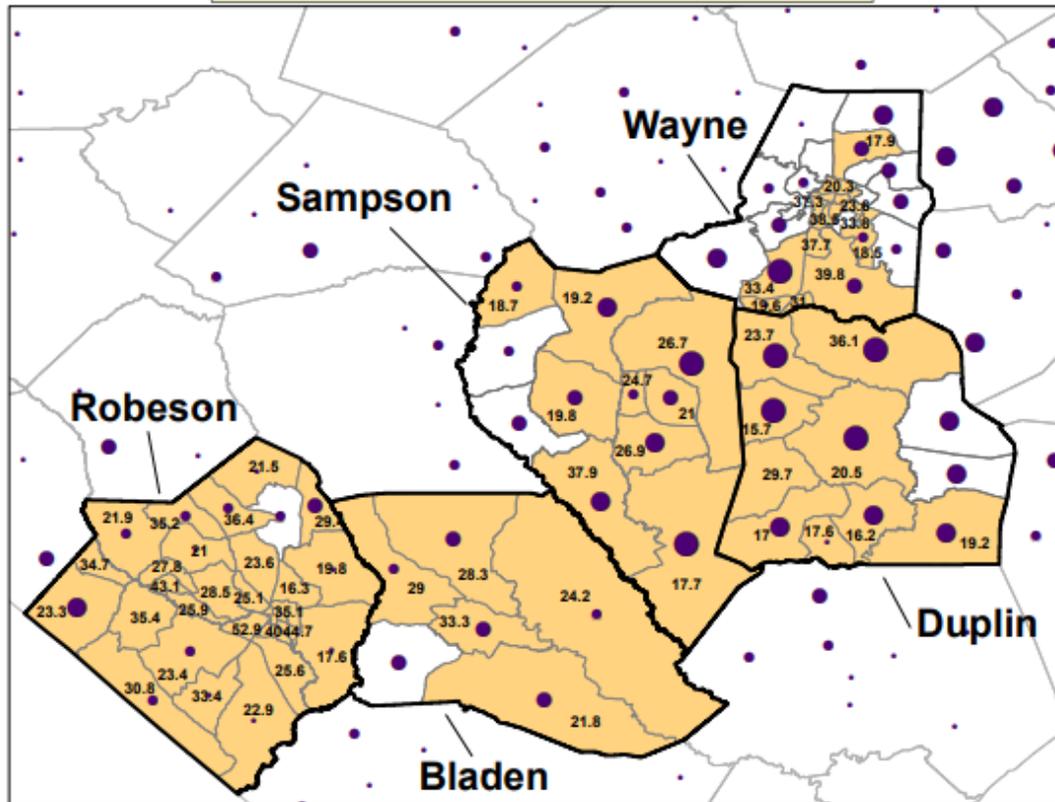
Poverty

The following maps show the top 5 counties as ranked by the SSLW per square mile. This was calculated on the census tract level and summed up to the county level. All census tracts that are flagged in comparison to either the state or county as laid out above are highlighted in yellow in the maps. Table 4 shows the 2020 Census data for the 5 counties and North Carolina.

Table 4. Poverty levels for the five counties with the highest SSLW per Square mile for Swine and North Carolina

| Geography | Total Population | MOE +/- | Percent below Poverty | MOE +/- |
|------------------|-------------------------|----------------|------------------------------|----------------|
| North Carolina | 9,984,891 | 1,988 | 14.7% | 0.2% |
| Bladen County | 32,918 | 214 | 24.3% | 3.2% |
| Duplin County | 58,374 | 229 | 21.2% | 2.6% |
| Robeson County | 128,917 | 494 | 27.7% | 1.1% |
| Sampson County | 62,511 | 272 | 20.9% | 2.5% |
| Wayne County | 120,420 | 494 | 20.2% | 1.2% |

Poverty and Swine
in Wayne, Duplin, Sampson,
Rodenson, and Bladen County, NC



Legend

Pounds of SSLW/Square Mile

- 1282 - 43300
- 43300 - 108339
- 108339 - 190260
- 190260 - 318667
- 318667 - 433801

Household Poverty 5% or Greater Than the County or State

- Not Flagged
- Flagged

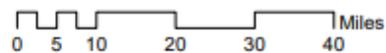


Figure 5. Map for the five counties and flagged census tracts for poverty.

5 Cattle

Across North Carolina, there are 222 cattle permits covered under the 2019 general permit. The following table (Table 5) outlines the 5 counties in North Carolina that have the highest amount of SSLW per square mile for cattle. Two portions of the analysis are included below. The first portion includes the entire state overlaying the SSLW at the block group level for potentially underserved communities and at the census tract level with Limited English Proficiency for Spanish speakers. The second portion of the analysis is at the census tract level and includes race and ethnicity, and poverty for the top five counties only. For cattle, the certificates of coverage are located across 34 counties.

Table 5. Counties with the highest Cattle SSLW per square mile

| County | SSLW/Sq mile |
|-----------------|--------------|
| Iredell County | 1,409,478.90 |
| Randolph County | 919,199.30 |
| Lincoln County | 431,896.80 |
| Davidson County | 408,691.25 |
| Gaston County | 351,827.30 |

5.1 Potentially Underserved Communities

The following figure (Figure 6) shows the potentially underserved block group selection overlaid with the cattle certificates of coverage averaged out to show SSLW per square mile.

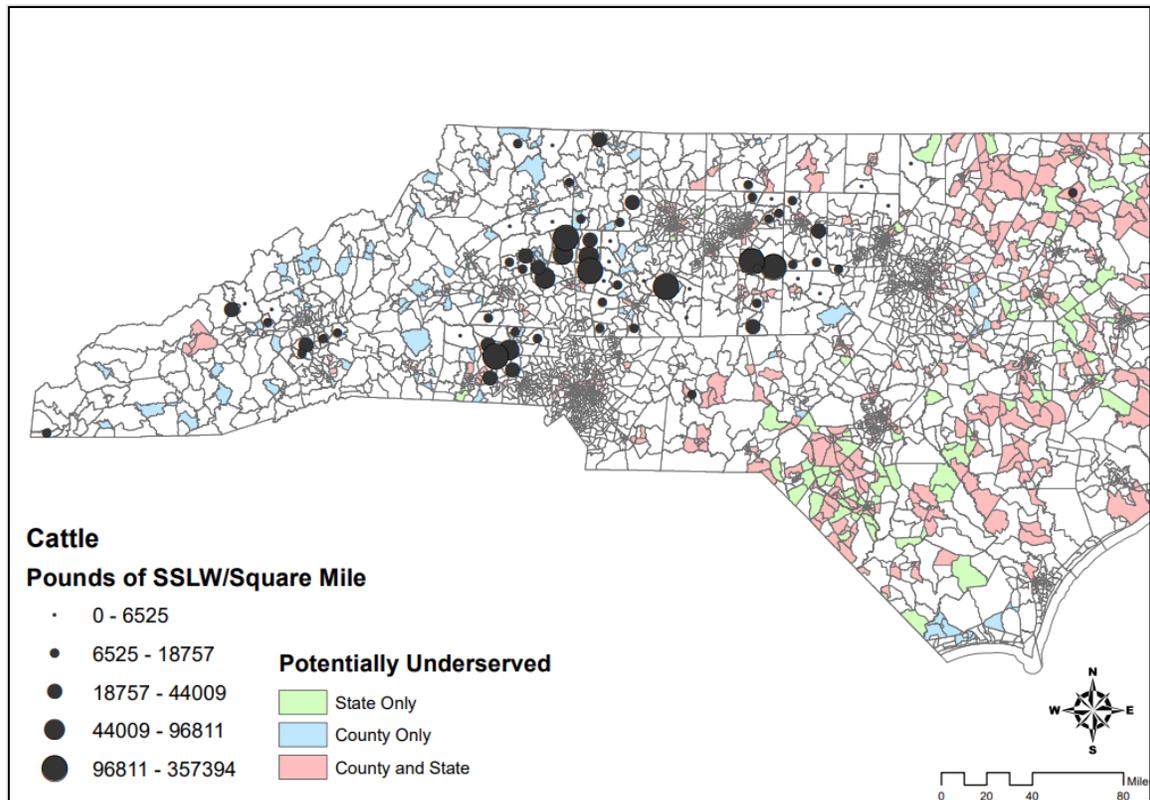


Figure 6. Cattle SSLW/Square Mile (census tracts) overlaid with Potentially Underserved Communities (Block Group).

5.2 Limited English Proficiency- Spanish

Per the Safe Harbor Guidelines, should an LEP Group be identified during the permit application process, written translations of vital documents for each eligible LEP language group that constitutes 5% or includes 1,000 members (whichever is less) of the population of persons eligible to be served or likely to be affected or encountered. If there are fewer than 50 persons in a language group that reaches the 5% trigger, then NCDEQ will not translate vital written materials, but instead will provide written notice in the primary language of the LEP language group of the right to receive competent oral interpretation of those written materials, free of cost. The safe harbor provisions apply to the translation of written documents only. Safe harbor guidelines are based on EPA guidance for LEP persons and implemented by NCDEQ when deemed appropriate.

The following figure (Figure 7) shows the census tracts across North Carolina with a population who speaks English less than very well for Spanish greater than 5% and the cattle SSLW per square mile.

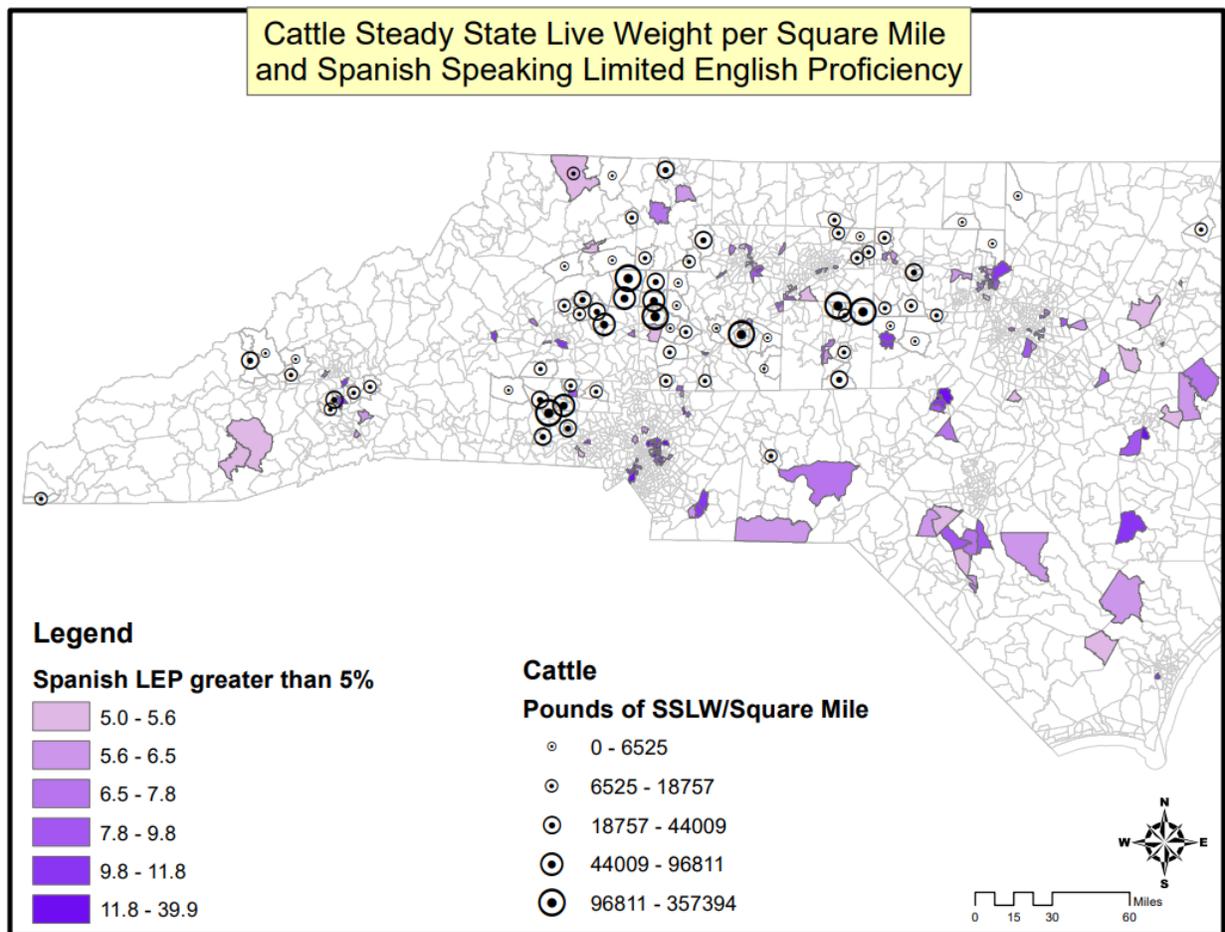


Figure 7. Census Tracts with Spanish speaking populations who speak English less than very well and SSLW averages for cattle.

5.3 Five County Analysis

Using standard environmental justice guidelines from the EPA and NEPA documentation, the following conditions will be flagged as communities with the potential for having environmental justice concerns:

2. 10% or more in comparison to the county or state average
3. 50% or more minority
4. 5% or more in comparison to the county or state average for poverty

For example, if a census tract has 35% of the population classified as low income but the county consists of 30% low income, the census tract would exceed the county average by 16.7% and thus be flagged as an area with the potential for having EJ concerns. 2020 Census Bureau data is real data gathered every ten years, whereas the estimates from the more recent years are modeled based on the real data.

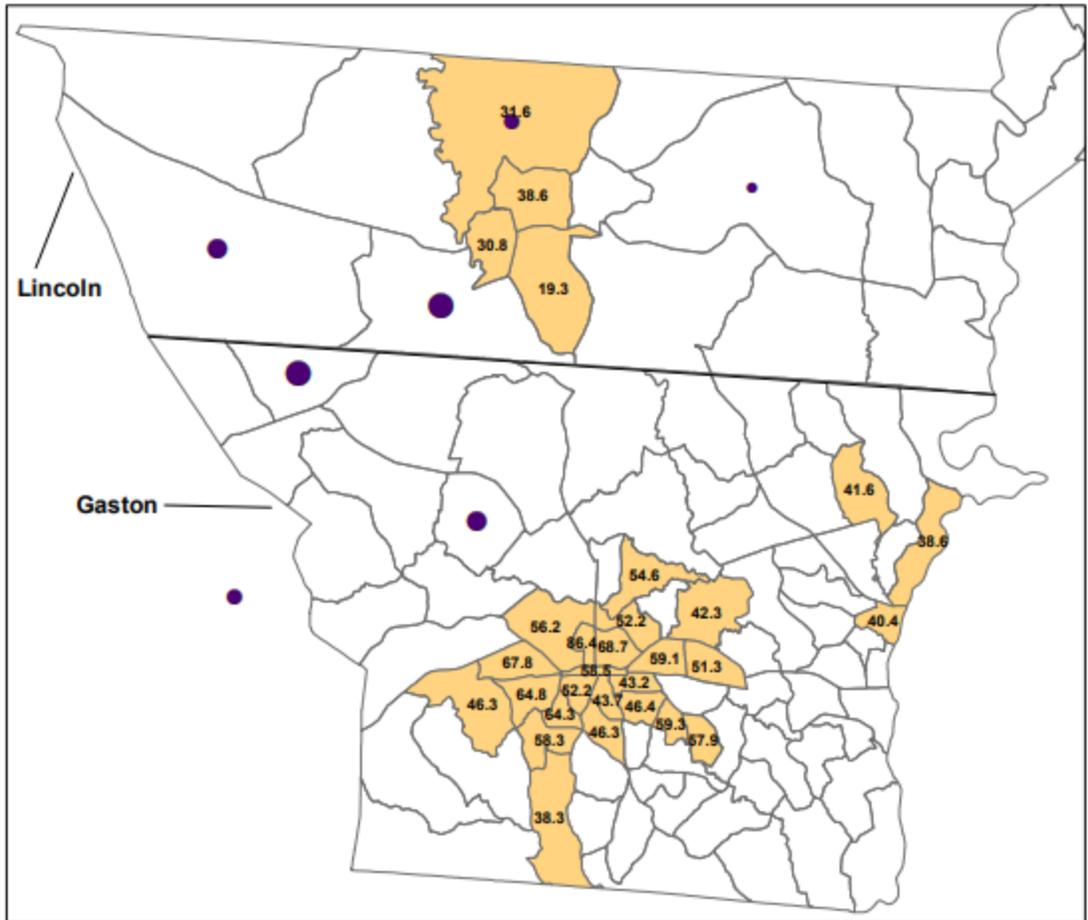
Race and Ethnicity

The following maps show the top 5 counties as ranked by the SSLW per square mile for cattle. This was calculated on the census tract level and summed up to the county level. All census tracts that are flagged in comparison to either the state or county as laid out above are highlighted in yellow in the maps. Table 6 shows the 2020 Census data for the 5 counties and North Carolina.

Table 6. Race and ethnicity for the five counties with the highest SSLW per Square mile for cattle and North Carolina

| Geography | Total population | Hispanic or Latino | White | Percent Non-white and Hispanic or Latino | Black or African American | American Indian and Alaska Native | Asian | Native Hawaiian and Pacific Islander | Some other Race | Two or more Races |
|------------------|-------------------------|---------------------------|--------------|---|----------------------------------|--|--------------|---|------------------------|--------------------------|
| North Carolina | 10,439,388 | 1,118,596 | 6,312,148 | 39.54% | 2,107,526 | 100,886 | 340,059 | 6,980 | 46,340 | 406,853 |
| Davidson County | 168,930 | 13,902 | 129,487 | 23.35% | 15,839 | 665 | 2,440 | 43 | 491 | 6,063 |
| Gaston County | 227,943 | 20,068 | 153,653 | 32.59% | 39,762 | 753 | 3,509 | 59 | 844 | 9,295 |
| Iredell County | 186,693 | 15,777 | 136,393 | 26.94% | 21,255 | 437 | 4,718 | 58 | 656 | 7,399 |
| Lincoln County | 86,810 | 6,412 | 71,661 | 17.45% | 4,405 | 237 | 692 | 15 | 208 | 3,180 |
| Randolph County | 144,171 | 19,051 | 108,354 | 24.84% | 8,592 | 666 | 2,158 | 10 | 412 | 4,928 |

Race and Ethnicity and Cattle in Lincoln and Gaston County, NC



Legend

Non White Hispanic or Latino 10% or Greater Than the County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 1475 - 6605
- 6605 - 14397
- 14397 - 28636
- 28636 - 60072
- 60072 - 175517

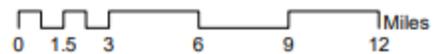
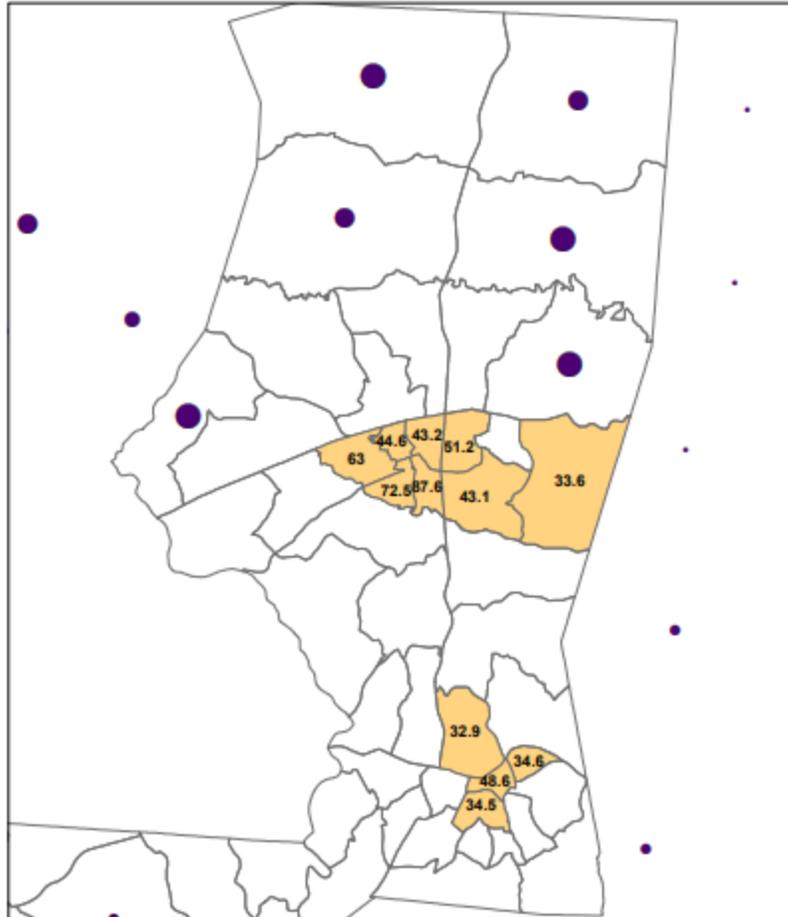


Figure 8. Map of Lincoln and Gaston Counties flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

Race and Ethnicity and Cattle in Iredell County, NC



Legend

Non White Hispanic or Latino 10% or Greater Than the County or State

□ Not Flagged

■ Flagged

Pounds of SSLW/Square Mile

- 1475 - 6605
- 6605 - 14397
- 14397 - 28636
- 28636 - 60072
- 60072 - 175517

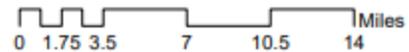


Figure 9. Map of Iredell County flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

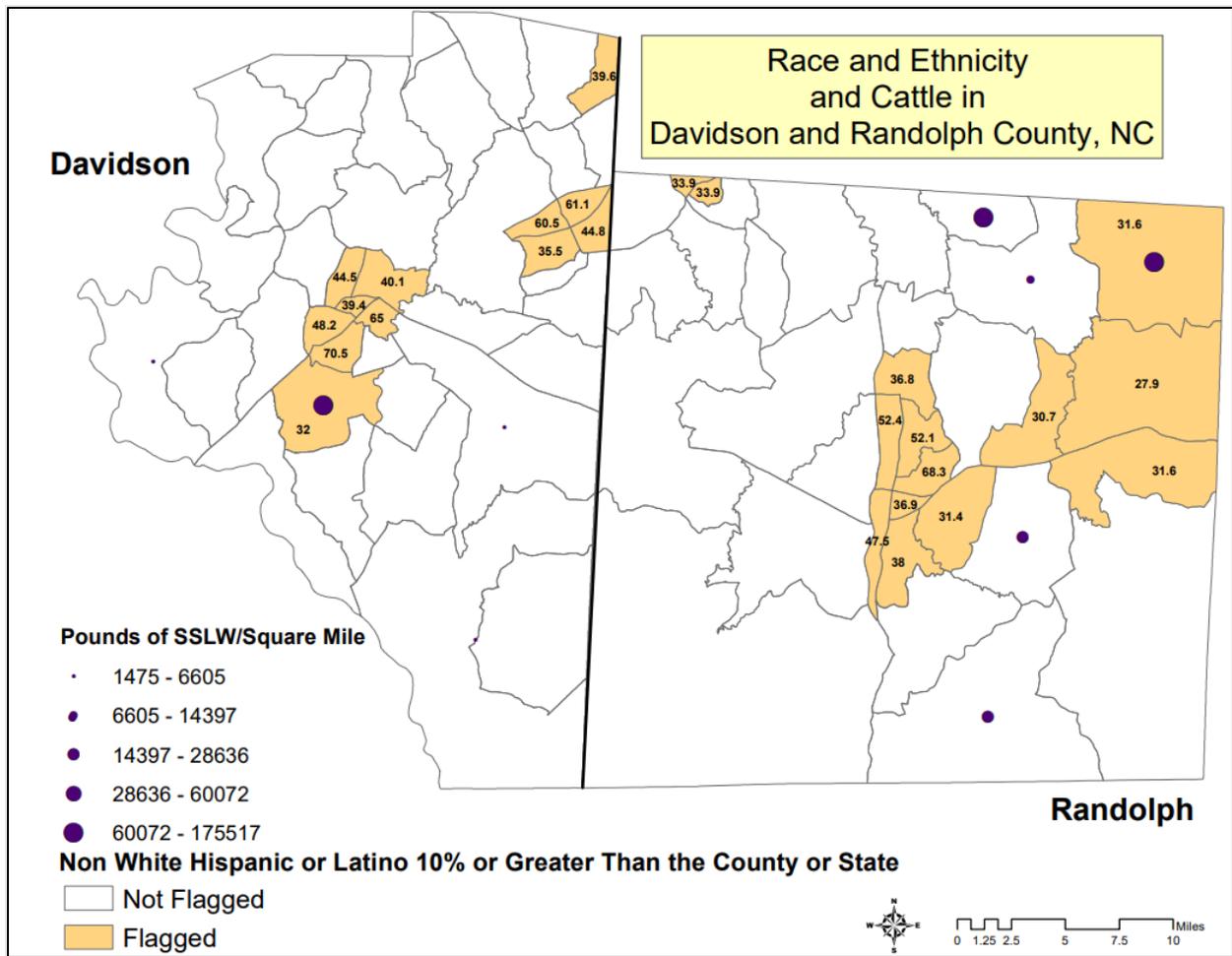


Figure 10. Map of Davidson and Randolph Counties flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

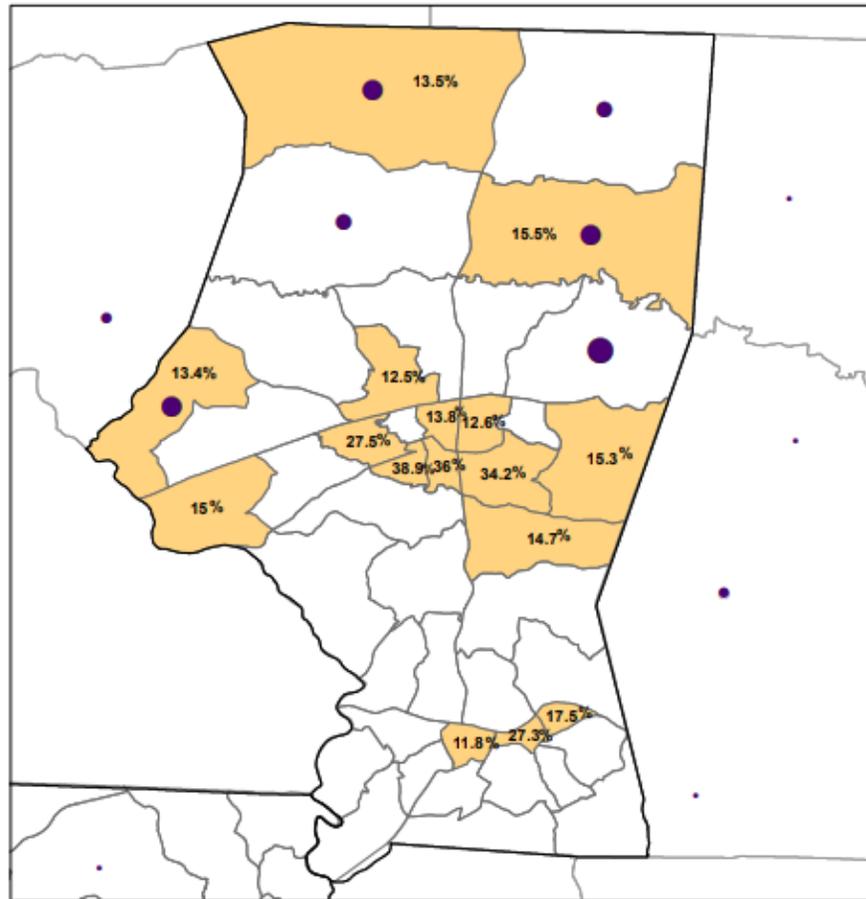
Poverty

The following maps show the top 5 counties as ranked by the SSLW per square mile. This was calculated on the census tract level and summed up to the county level. All census tracts that are flagged in comparison to either the state or county as laid out above are highlighted in yellow in the maps. Table 7 shows the 2020 Census data for the 5 counties and North Carolina.

Table 7. Poverty levels for the five counties with the highest SSLW per Square mile for cattle and North Carolina

| Geography | Total Population | MOE +/- | Percent below Poverty | MOE +/- |
|-----------------|------------------|---------|-----------------------|---------|
| North Carolina | 9,984,891 | 1,988 | 14.7% | 0.2% |
| Davidson County | 162926 | 490 | 15.4% | 1.2% |
| Gaston County | 215978 | 399 | 14.5% | 0.9% |
| Iredell County | 173761 | 316 | 10.9% | 0.9% |
| Lincoln County | 82082 | 211 | 12.1% | 1.4% |
| Randolph County | 141274 | 345 | 15.2% | 1.3% |

Poverty and Cattle in Iredell County, NC



Legend

Household Poverty 5% or Greater Than the County or State

Not Flagged

Flagged

Pounds of SSLW/Square Mile

- 2250 - 16000
- 16000 - 43953
- 43953 - 91264
- 91264 - 149852
- 149852 - 266301

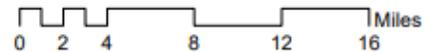
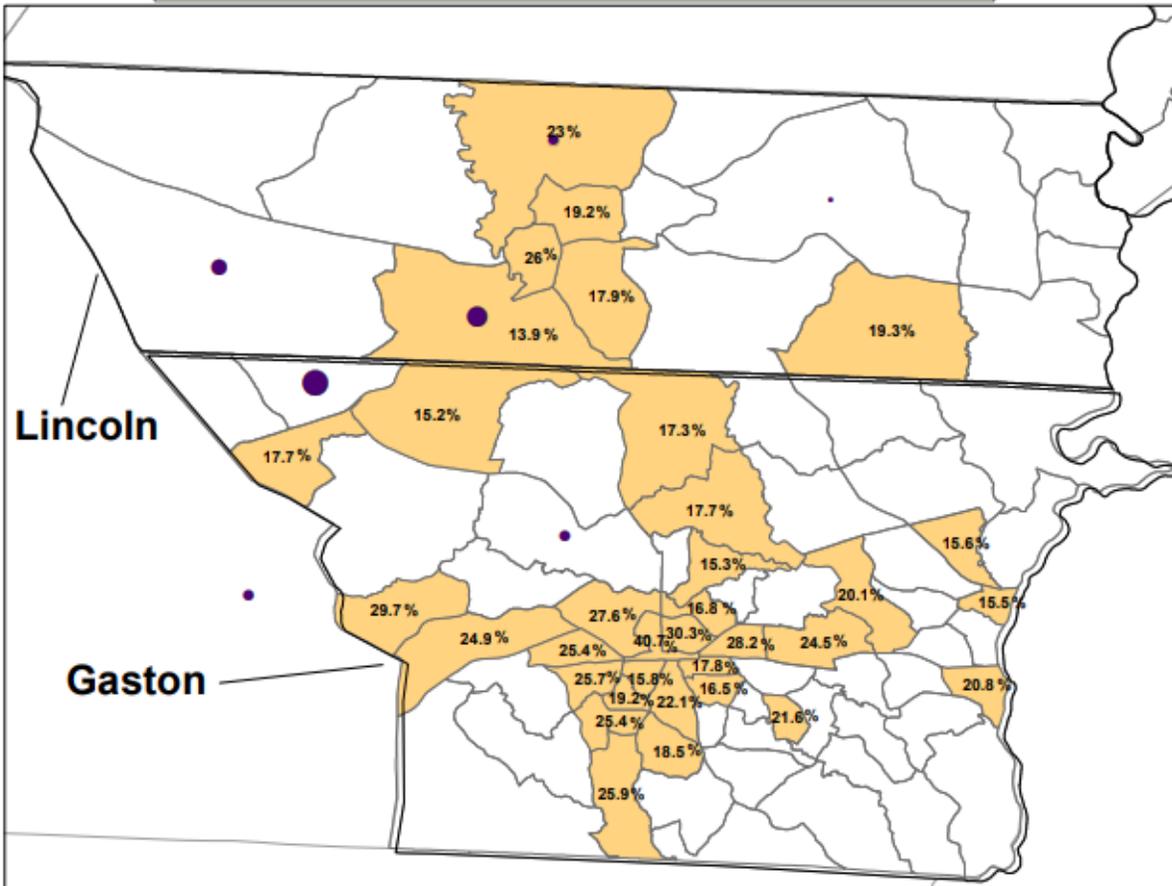


Figure 11. Map for Iredell County and flagged census tracts for poverty.

Poverty and Cattle in Lincoln and Gaston County, NC



Legend

Household Poverty 5% or Greater Than the County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 2250 - 16000
- 16000 - 43953
- 43953 - 91264
- 91264 - 149852
- 149852 - 266301

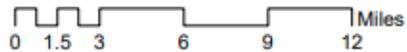


Figure 12. Map for Lincoln and Gaston Counties and flagged census tracts for poverty.

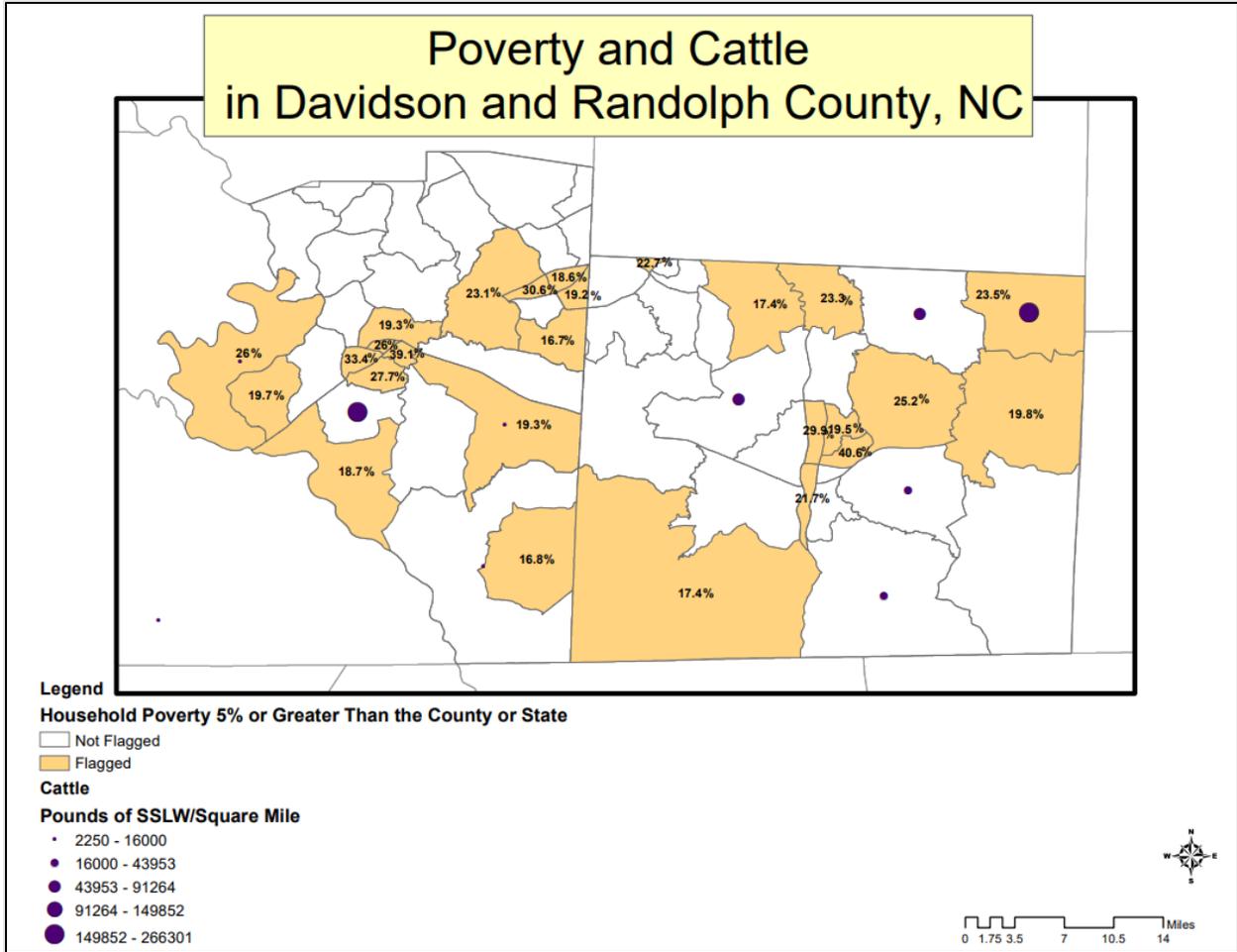


Figure 13. Map for Davidson and Randolph Counties and flagged census tracts for poverty.

6 Wet Poultry

Across North Carolina, there are 9 wet poultry permits covered under the 2019 general permit. The following table (Table 8) outlines the 5 counties in North Carolina that have the highest amount of SSLW per square mile for Wet Poultry. Two portions of the analysis are included below. The first portion includes the entire state overlaying the SSLW at the block group level for potentially underserved communities and at the census tract level with Limited English Proficiency for Spanish speakers. The second portion of the analysis is at the census tract level and includes race and ethnicity, and poverty for the top five counties only. For poultry, the certificates of coverage are located across 5 counties.

Table 8. SSLW per Square Mile: top 5 counties for wet poultry

| County | SSLW /sq Mile |
|----------------|---------------|
| Union County | 119,149.00 |
| Hyde County | 34,756.40 |
| Nash County | 24,577.80 |
| Orange County | 8,571.43 |
| Halifax County | 4,528.30 |

6.1 Potentially Underserved Communities

The following figure (Figure 14) shows the potentially underserved block group selection overlaid with the wet poultry certificates of coverage averaged out to show SSLW per square mile.

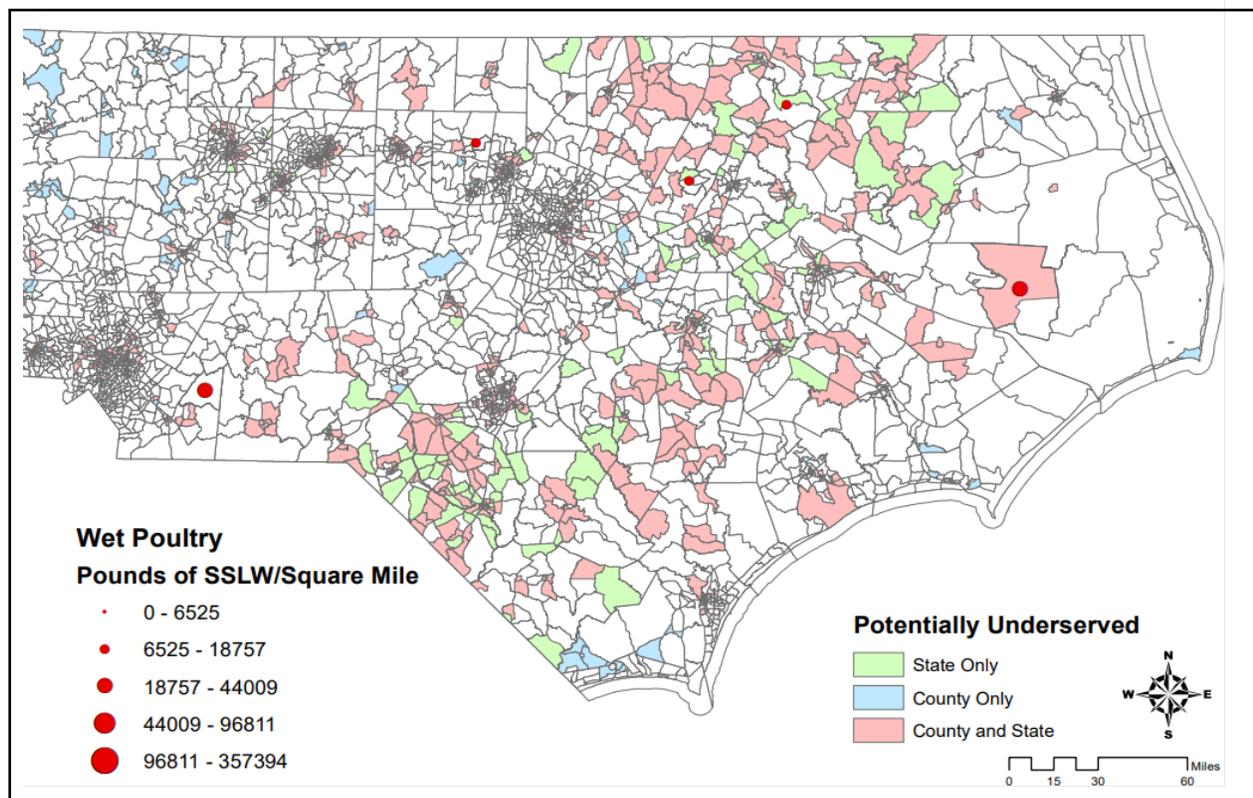


Figure 14. Wet poultry SSLW/Square Mile (census tracts) overlaid with Potentially Underserved Communities (Block Group).

6.2 Limited English Proficiency- Spanish

Per the Safe Harbor Guidelines, should an LEP Group be identified during the permit application process, written translations of vital documents for each eligible LEP language group that constitutes 5% or includes 1,000 members (whichever is less) of the population of persons eligible to be served or likely to be affected or encountered. If there are fewer than 50 persons in a language group that reaches the 5% trigger, then NCDEQ will not translate vital written materials, but instead will provide written notice in the primary language of the LEP language group of the right to receive competent oral interpretation of those written materials, free of cost. The safe harbor provisions apply to the translation of written documents only. Safe harbor guidelines are based on EPA guidance for LEP persons and implemented by NCDEQ when deemed appropriate.

The following figure (Figure 15) shows the census tracts across North Carolina with a population who speaks English less than very well for Spanish greater than 5%.

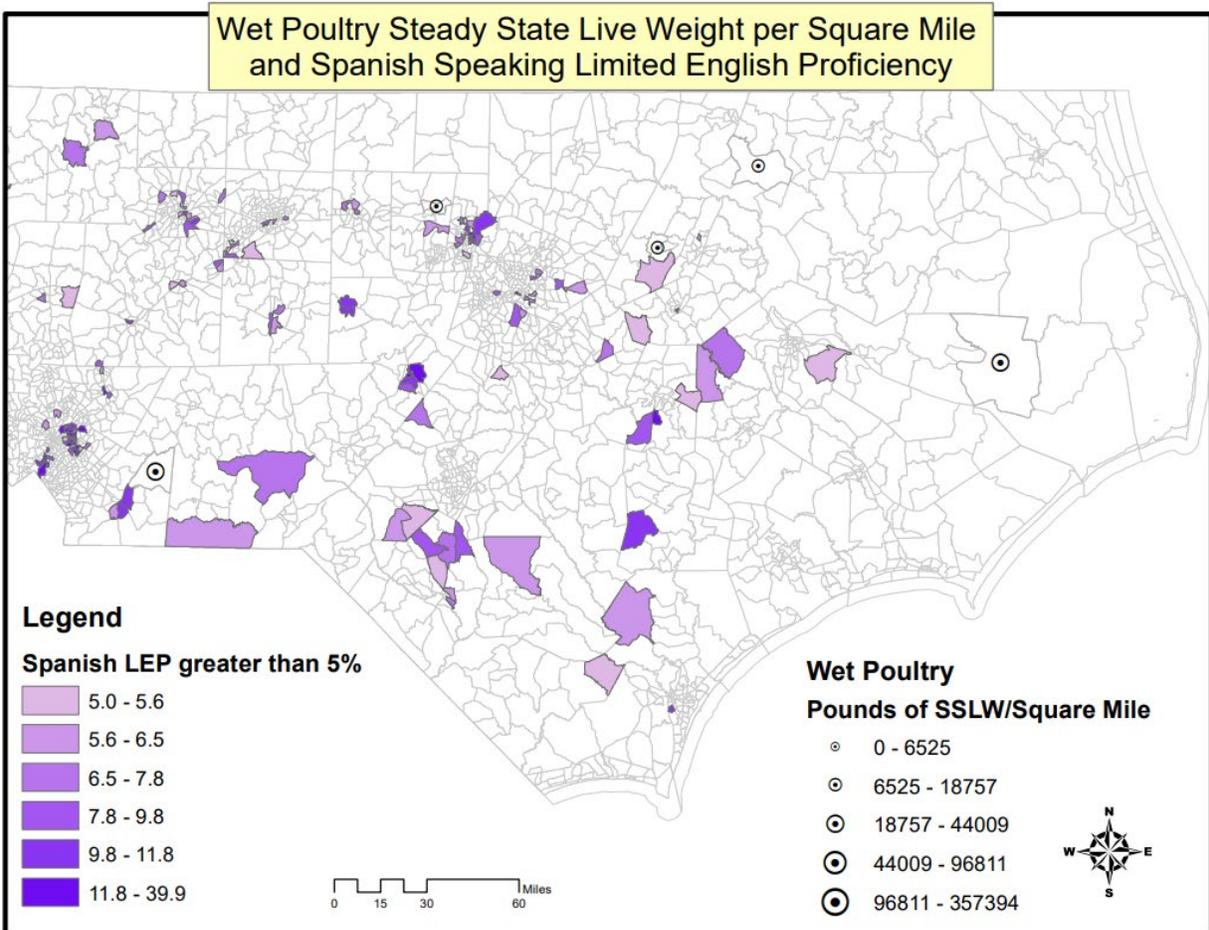


Figure 15. Census tracts with Spanish speaking populations who speak English less than very well and SSLW averages for wet poultry.

6.3 Five County Analysis

Using standard environmental justice guidelines from the EPA and NEPA documentation, the following conditions will be flagged as communities with the potential for having environmental justice concerns:

3. 10% or more in comparison to the county or state average
4. 50% or more minority
5. 5% or more in comparison to the county or state average for poverty

For example, if a census tract has 35% of the population classified as low income but the county consists of 30% low income, the census tract would exceed the county average by 16.7% and thus be flagged as an area with the potential for having EJ concerns. 2020 Census Bureau data is real data gathered every ten years, whereas the estimates from the more recent years are modeled based on the real data.

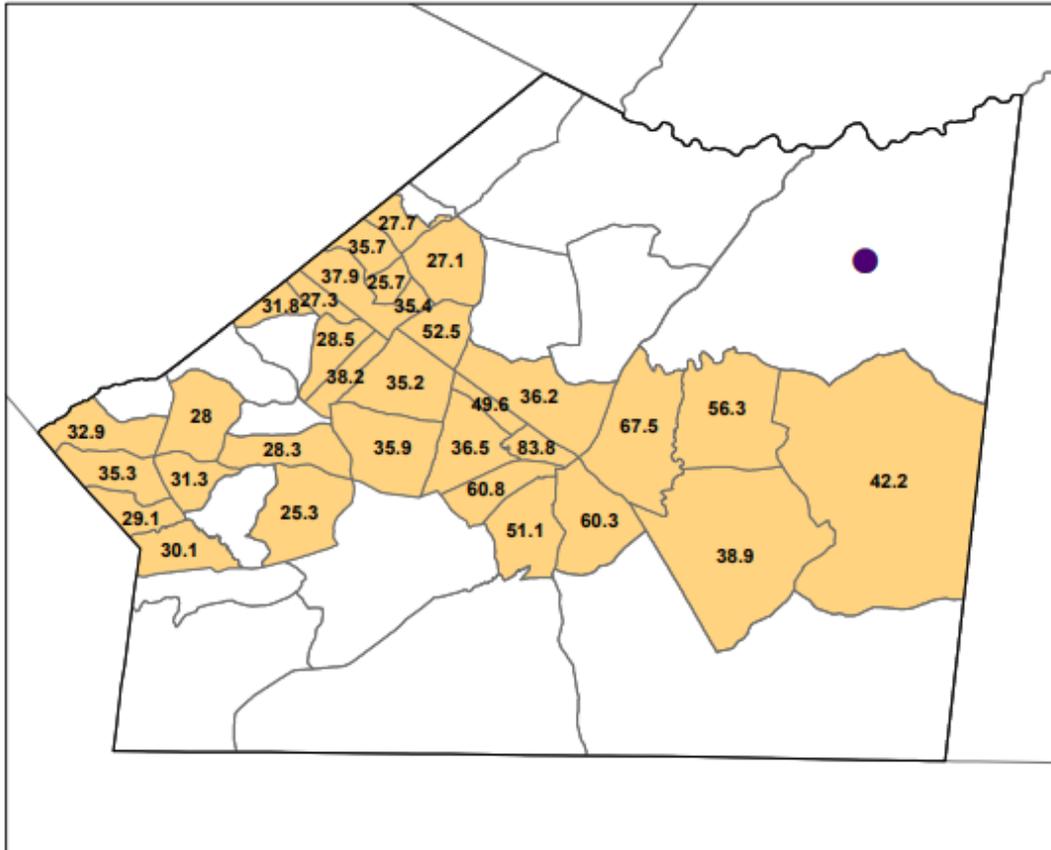
Race and Ethnicity

The following maps show the top 5 counties as ranked by the SSLW per square mile. This was calculated on the census tract level and summed up to the county level. All census tracts that are flagged in comparison to either the state or county as laid out above are highlighted in yellow in the maps. Table 9 shows the 2020 Census data for the 5 counties and North Carolina.

Table 9. Race and Ethnicity for the five counties with the highest SSLW per Square mile for Poultry and North Carolina.

| Geography | Total Population | Hispanic or Latino | White | Percent non-White and Hispanic or Latino | Black or African American | American Indian and Alaska Native | Asian | Native Hawaiian and Pacific Islander | Some other race | Two or more races |
|------------------|-------------------------|---------------------------|--------------|---|----------------------------------|--|--------------|---|------------------------|--------------------------|
| North Carolina | 10,439,388 | 1,118,596 | 6,312,148 | 39.5% | 2,107,526 | 100,886 | 340,059 | 6,980 | 46,340 | 406,853 |
| Halifax County | 48,622 | 1454 | 19,070 | 60.8% | 24737 | 1593 | 281 | 11 | 142 | 1334 |
| Hyde County | 4,589 | 347 | 2,928 | 36.2% | 1152 | 7 | 7 | 2 | 15 | 131 |
| Nash County | 94,970 | 7322 | 46,317 | 51.2% | 36679 | 615 | 904 | 28 | 407 | 2698 |
| Orange County | 148,696 | 15812 | 96,537 | 35.1% | 15571 | 334 | 12615 | 43 | 798 | 6986 |
| Union County | 23,8267 | 30110 | 161,113 | 32.4% | 26500 | 641 | 9516 | 90 | 1199 | 9098 |

Race and Ethnicity and Poultry in Union County, NC



Legend

Non White Hispanic and Latino 10% or Greater Than County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 8571
- 8571 - 9617
- 9617 - 11886
- 11886 - 26183
- 26183 - 43410

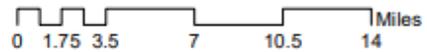


Figure 16. Map of Union County flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

Race and Ethnicity and Poultry in Orange County, NC

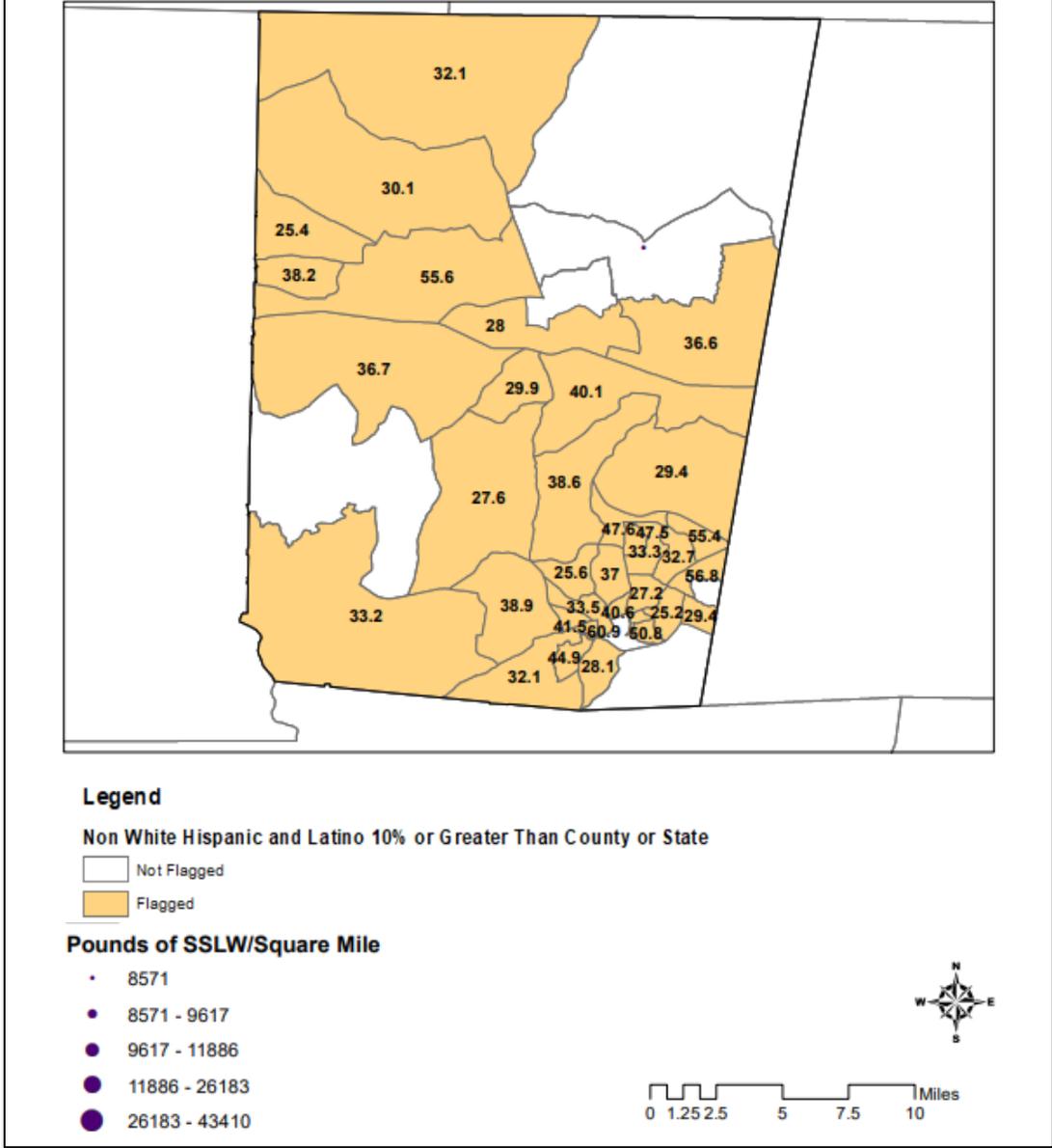
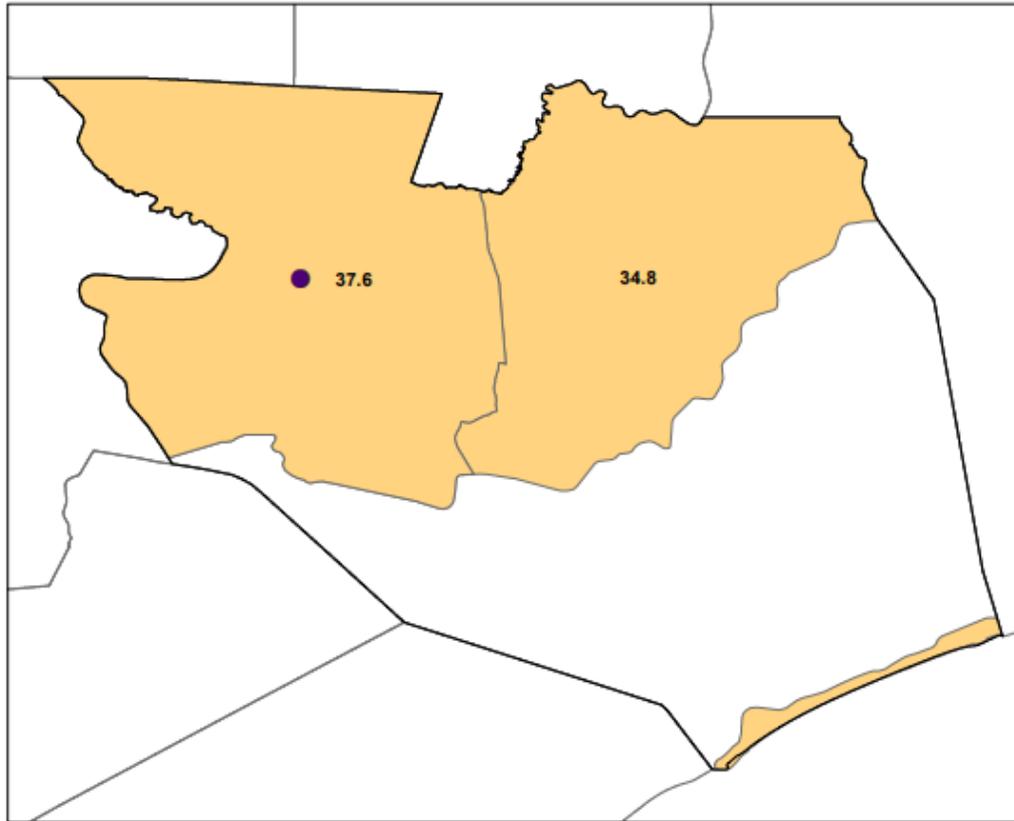


Figure 17. Map of Orange County flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

Race and Ethnicity and Poultry in Hyde County, NC



Legend

Non White Hispanic and Latino 10% or Greater Than County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 8571
- 8571 - 9617
- 9617 - 11886
- 11886 - 26183
- 26183 - 43410

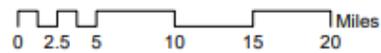
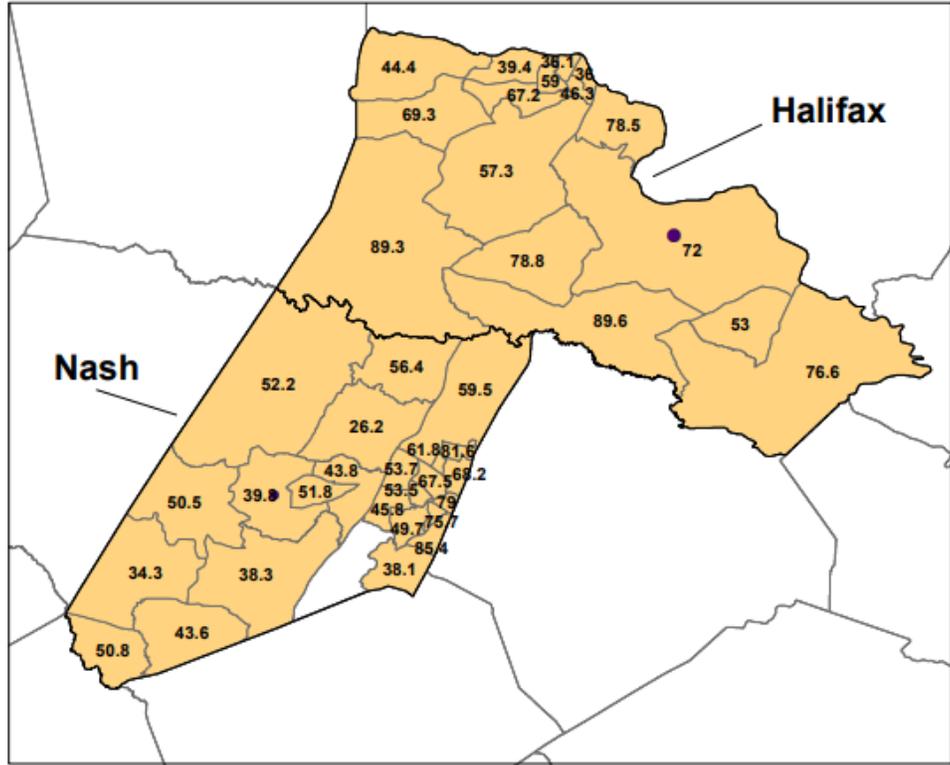


Figure 18. Map of Hyde County flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

Race and Ethnicity and Poultry in Nash and Halifax County, NC



Legend

Non White Hispanic and Latino 10% or Greater Than County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 8571
- 8571 - 9617
- 9617 - 11886
- 11886 - 26183
- 26183 - 43410

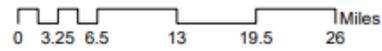


Figure 19. Map of Nash and Halifax Counties flagged census tracts for Nonwhite and Hispanic or Latino greater than 10% compared to the county or state.

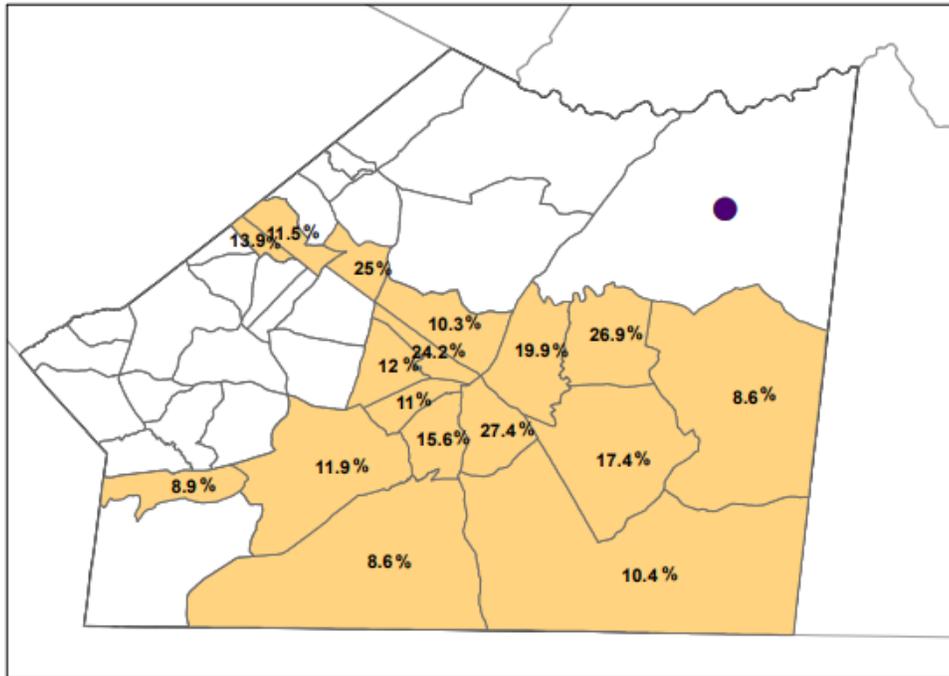
Poverty

The following maps show the top 5 counties as ranked by the SSLW per square mile. This was calculated on the census tract level and summed up to the county level. All census tracts that are flagged in comparison to either the state or county as laid out above are highlighted in yellow in the maps. Table 10 shows the 2020 Census data for the 5 counties and North Carolina.

Table 10. Poverty levels for the five counties with the highest SSLW per Square mile for Poultry and North Carolina

| Geography | Total Population | MOE +/- | Percent below Poverty | MOE +/- |
|------------------|-------------------------|----------------|------------------------------|----------------|
| North Carolina | 9,984,891 | 1,988 | 13.6% | 0.3% |
| Halifax County | 49,855 | 255 | 25.8% | 2.2% |
| Hyde County | 4,624 | 152 | 24.3% | 9.2% |
| Nash County | 92,009 | 374 | 15.2% | 1.5% |
| Orange County | 133,298 | 744 | 13.7% | 0.9% |
| Union County | 227,980 | 366 | 8.2% | 0.7% |

Poverty and Wet Poultry in Union County, NC



Legend

Household Poverty 5% or Greater Than the County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 6857
- 6857 - 11956
- 11956 - 18378
- 18378 - 22109
- 22109 - 65116

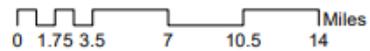
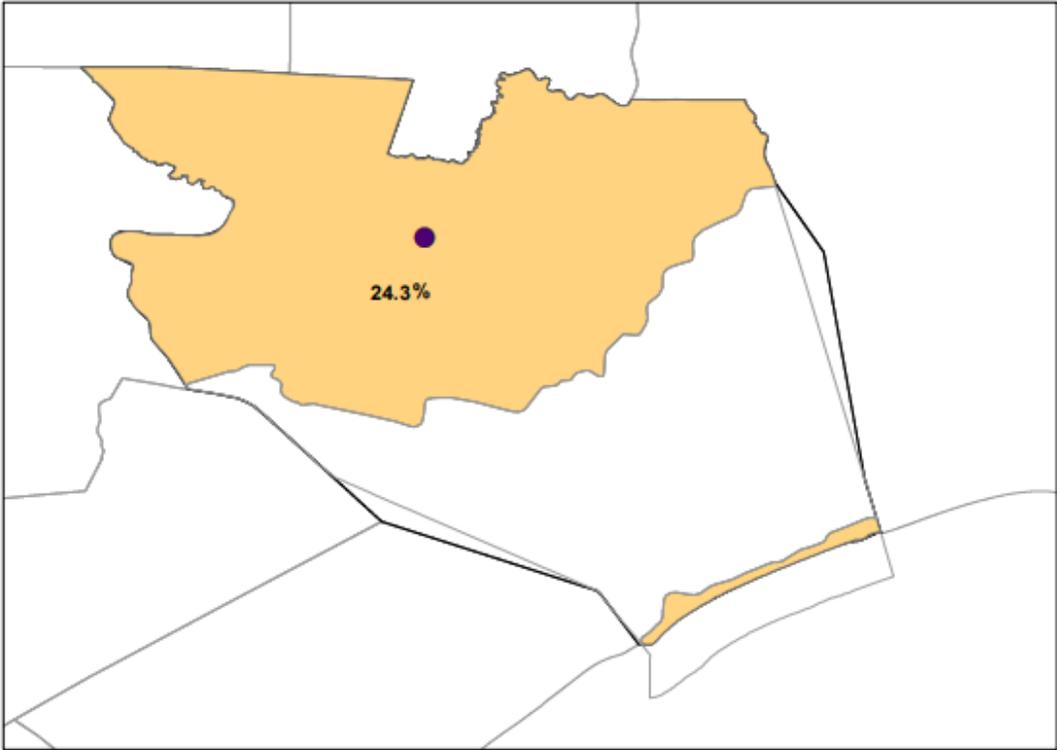


Figure 20. Map of Union County flagged census tracts for poverty.

Poverty and Wet Poultry in Hyde County, NC



Legend

Household Poverty 5% or Greater Than the County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 6857
- 6857 - 11956
- 11956 - 18378
- 18378 - 22109
- 22109 - 65116

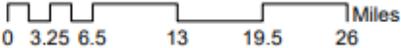
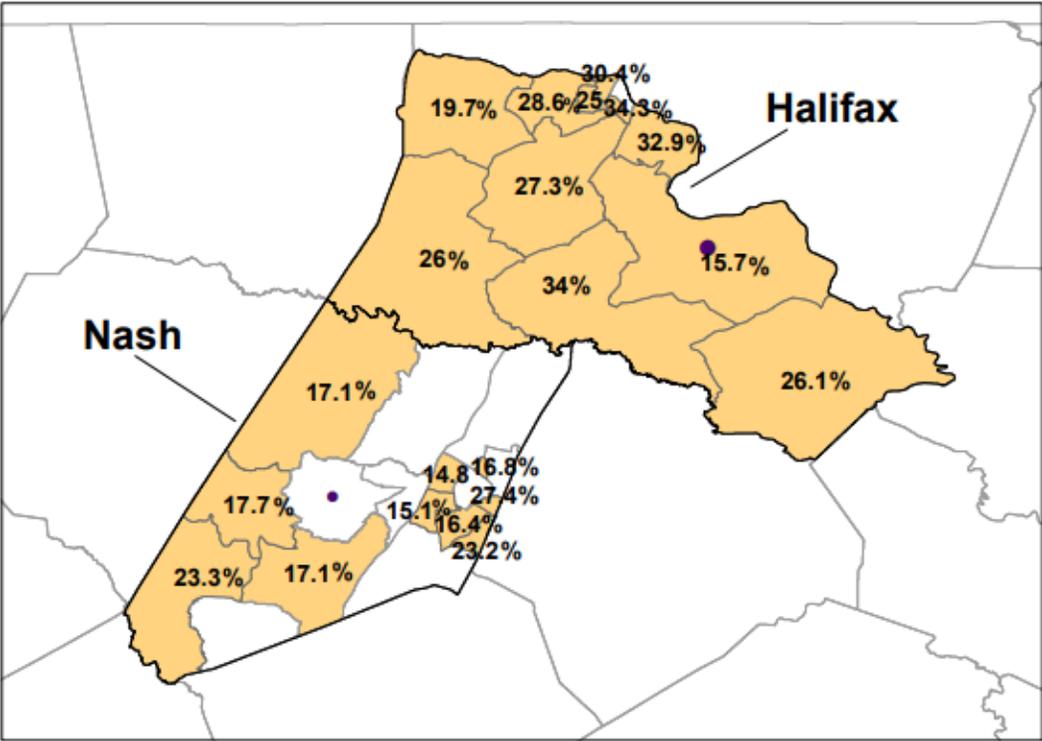


Figure 21. Map of Hyde County flagged census tracts for poverty.

Poverty and Wet Poultry in Nash and Halifax County, NC



Legend

Household Poverty 5% or Greater Than the County or State

- Not Flagged
- Flagged

Pounds of SSLW/Square Mile

- 6857
- 6857 - 11956
- 11956 - 18378
- 18378 - 22109
- 22109 - 65116

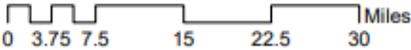


Figure 22. Map of Nash and Halifax Counties flagged census tracts for poverty.

Poverty and Wet Poultry in Orange County, NC

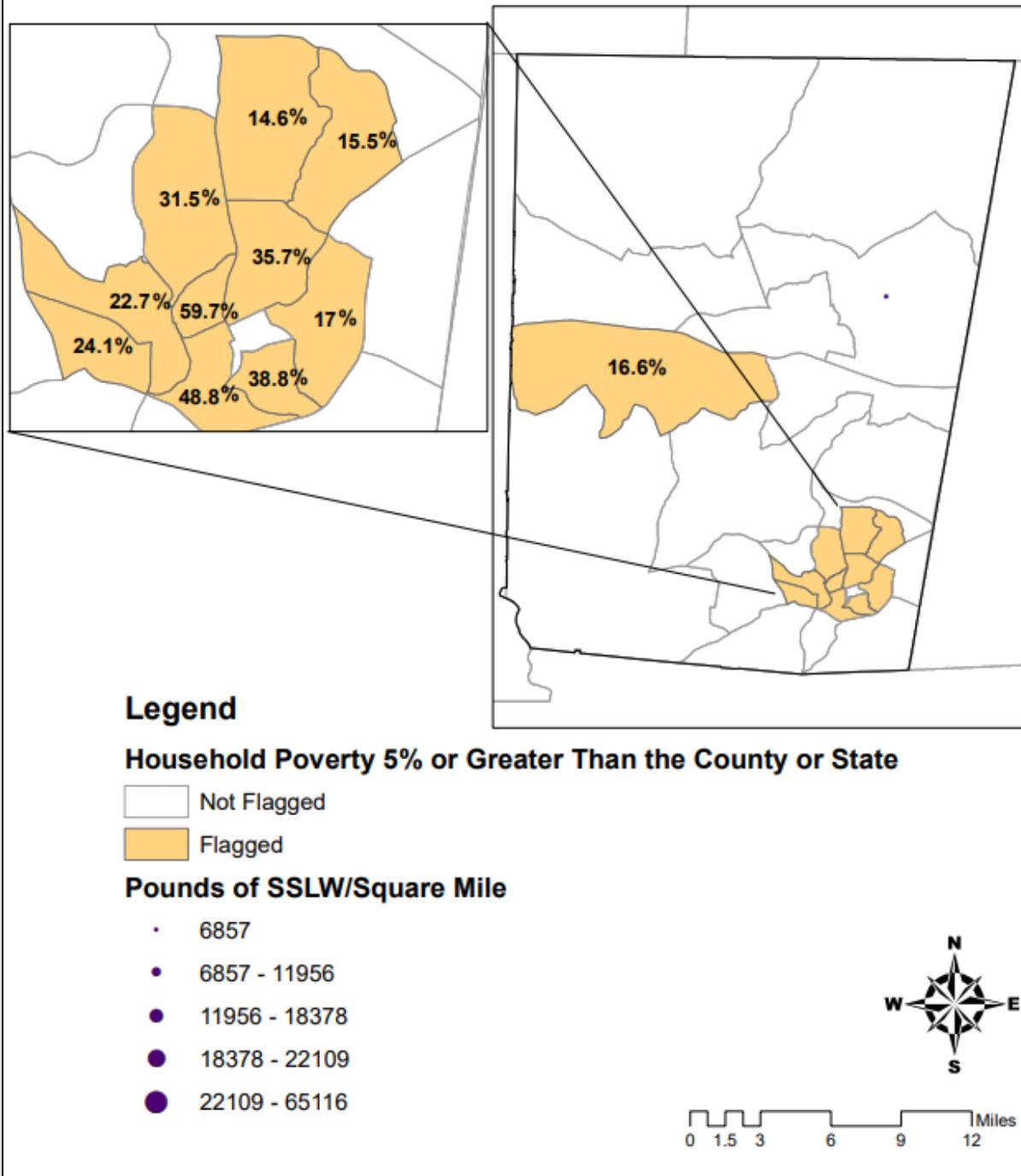


Figure 23. Map of Orange County flagged census tracts for poverty.

7 Tribal Communities

Across North Carolina, there are 7 state recognized tribes and 1 federally recognized tribe. Additionally, there are 4 Urban Indian Organizations. According to the Commission of Indian Affairs, these tribes and tribal organizations reside in 27 counties across North Carolina (Figure 24).

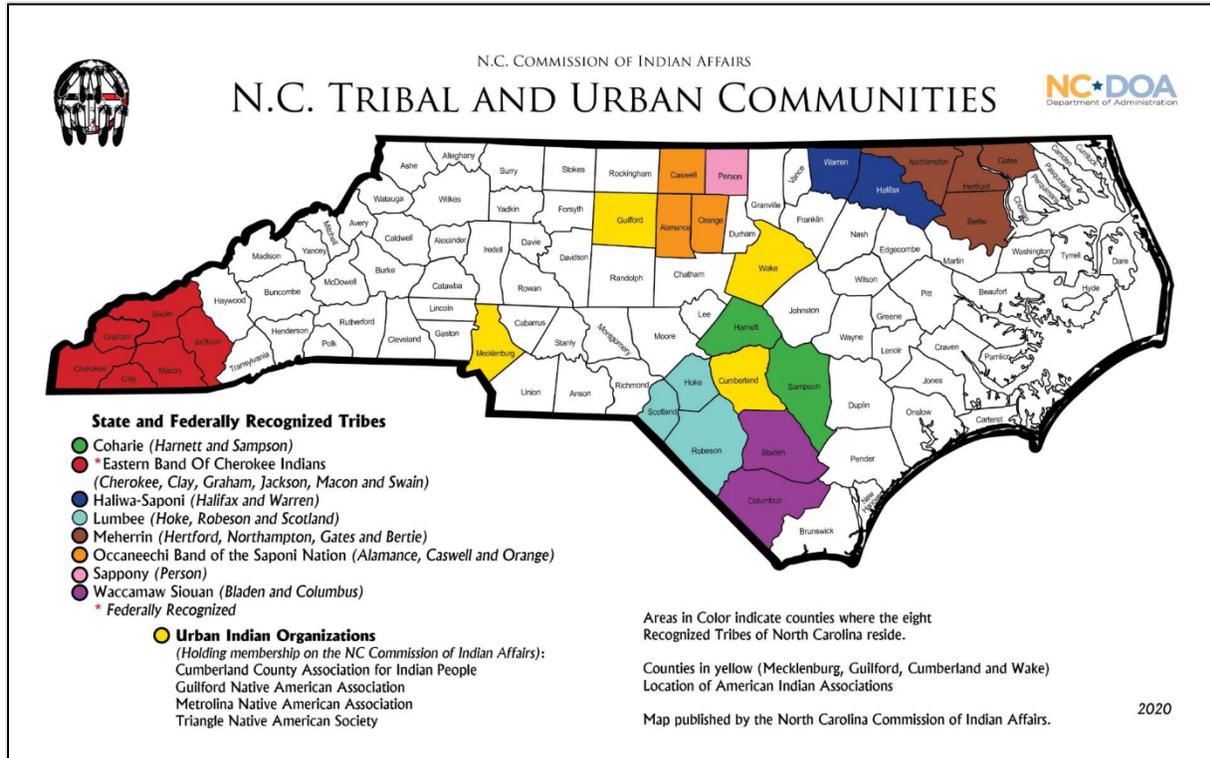


Figure 24. Map of North Carolina Tribal Communities (<https://ncadmin.nc.gov/public/american-indians/map-nc-tribal-communities>).

8 County Health Rankings

The University of Wisconsin Population Health Institute, in collaboration with the Robert Wood Johnson Foundation, calculated County Health Rankings for all the States in the United States (www.countyhealthrankings.org). This ranking is based on health outcomes (such as lifespan and self-reported health status) and health factors (such as environmental, social and economic conditions). The following, Figure 25, ranks all 100 counties in North Carolina, with 1 indicating the healthiest. Tables 11-13 outline the health rankings for the 5 counties with the highest SSLW for each permit type included in the above analysis.

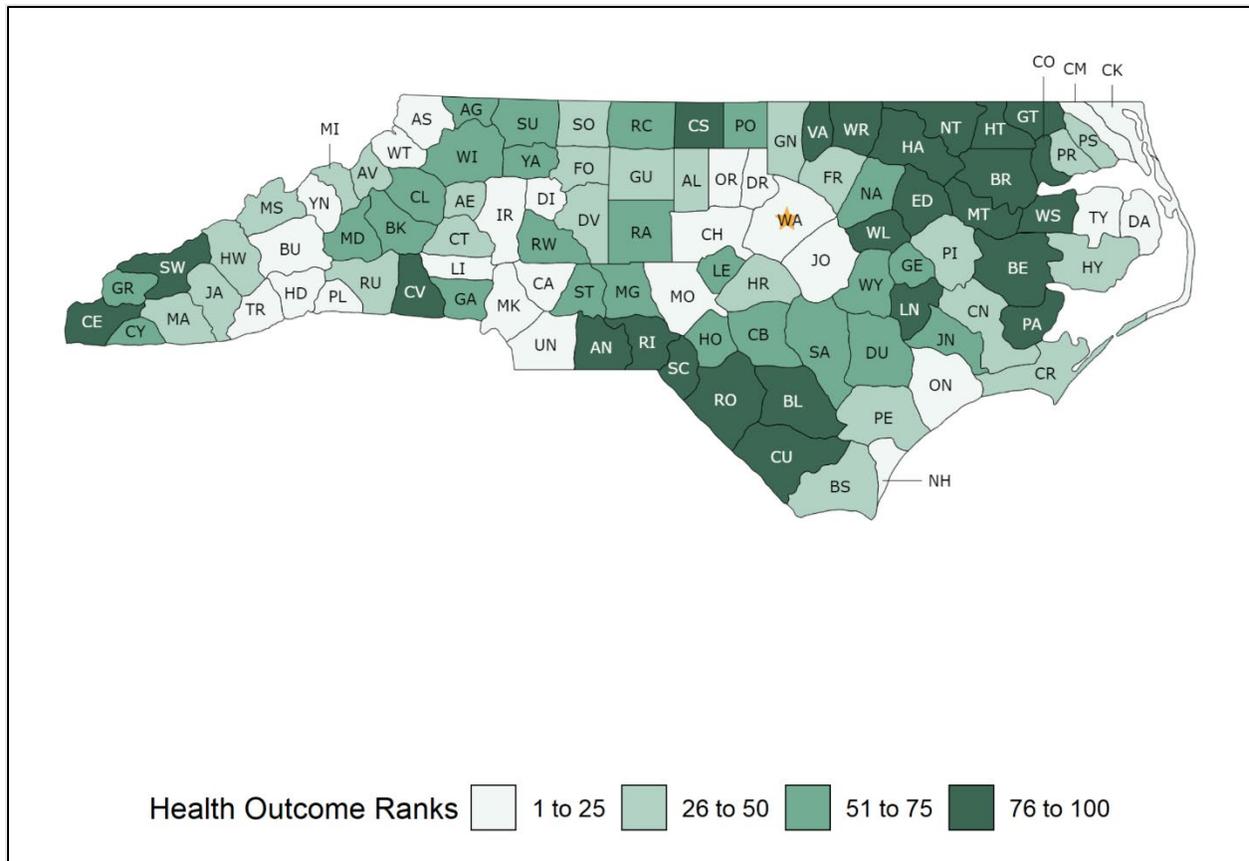


Figure 25. County Health Outcome Rankings for Health Factors in North Carolina provided by University of Wisconsin Public Health Institute

Table 11. Health information for the five counties with highest amount of SSLW per Square Mile for swine

| Geography | Health Factors Ranking | Health Outcomes Ranking |
|----------------|------------------------|-------------------------|
| Bladen County | 93 | 86 |
| Duplin County | 85 | 58 |
| Robeson County | 100 | 100 |
| Sampson County | 80 | 67 |
| Wayne County | 70 | 64 |

Table 12. Health information for the five counties with highest amount of SSLW per Square Mile for cattle

| Geography | Health Factors Ranking | Health Outcomes Ranking |
|------------------|-------------------------------|--------------------------------|
| Davidson County | 47 | 49 |
| Gaston County | 40 | 51 |
| Iredell County | 17 | 15 |
| Lincoln County | 26 | 25 |
| Randolph County | 49 | 52 |

Table 13. Health information for the five counties with highest amount of SSLW per Square Mile for wet poultry

| Geography | Health Factors Ranking | Health Outcomes Ranking |
|------------------|-------------------------------|--------------------------------|
| Union County | 7 | 3 |
| Hyde County | 86 | 46 |
| Nash County | 63 | 62 |
| Orange County | 1 | 2 |
| Halifax County | 98 | 95 |

9 Conclusion

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (US EPA). This EJ report examined the SSLW per square mile for the three types of permits in North Carolina; wet poultry, swine, and cattle. Demographic data for poverty, race and ethnicity, and limited English proficiency was also analyzed.

It is important to note that this is an analysis of the facilities with current 2019 general permits and it is not anticipated that every facility covered under the 2019 general permits will apply for the new digester general permits. Additionally, the new digester general permits will replace the existing general permits only if the facility applies for the digester general permit. As it is not possible to predict which facilities will install digesters under the new general permits, this analysis relies on general information and is not a site-specific examination.

Based on the results from this analysis, the following outreach recommendations were conducted:

Based on the results from this EJ Report, DEQ provided the following outreach:

- Established a website, <https://deq.nc.gov/digesterpermits>, to provide an overview of the permit development process with key dates and documents updated during the process. This included information on the public hearing and permit drafts.
- DEQ staff listened into the EJEAB's special listening session on Oct. 12, 2021, to gain insight of community concerns surrounding draft permits.
- Held two virtual technical stakeholder meetings on November 19 and December 8, 2021, to inform development of draft permits. Stakeholders included environmental and community-based organizations and subject matter experts. DEQ hired an independent facilitator to moderate both stakeholder meetings as recommended by the EJEAB;
- Conducted a virtual public input meeting on Dec. 14, 2021, as part of the stakeholder process, moderated by the independent facilitator;
- Provided opportunities for public comment on the draft permit development by mail, by email and by phone and at the virtual session which was open to the public. Press releases were sent to statewide media outlets, interested parties and DEQ's EJ listserv on the public meeting on Nov. 3 and Dec. 6, 2021.
- Posted a recording of the public meeting and summaries of comments received in the stakeholder meetings for public review on the dedicated webpage.
- For the comment period on the Draft permit, DWR published the notice for public comment in newspapers in both Sampson and Duplin counties, as well as newspapers in Asheville, Charlotte, Fayetteville, Raleigh, Statesville, Washington and Wilmington, on the week of Feb. 2, 2022.
- Set a 90-day public comment period from Feb. 2-May 2, 2022, to receive comments on the three draft permits as recommended by the EJEAB
- Provided a 60-day or longer notice for four public hearings as recommended by the EJEAB
- Provided draft permits on three types of facilities on the DEQ website and at public meeting sites, showing both the proposed language and a redlined copy showing how each permit differed from the 2019 general permit language. Spanish translations were also provided for each.

- Sent press releases to statewide media outlets, interested parties and DEQ's EJ listserv on these meetings on Feb. 1, March 3, March 22, April 8 and April 18, 2022.
- Mailed the public notice in English and Spanish to approximately 130 churches across Eastern North Carolina
- Translated the public notice into Spanish and published the notice on the DEQ website as recommended by the EJEAB;
- Offered the option to request interpretation services for the public hearings;
- Provided option to comment via phone lines, by email or by mail for the potential for lack of internet access;
- Held four public hearings, one each in Sampson, Duplin and Iredell counties, as well as a virtual meeting option - as recommended by the EJEAB.
- Hired an independent facilitator to moderate all four public hearings Communicated the notices and information throughout the process with the tribes, tribal organizations, and Commission of Indian Affairs across the state;
- Worked with known community leaders across the state to distribute information to hard-to-reach communities, with a focus on the counties included in this analysis.
- Consulted with local and state-wide Environmental and Community-based organizations to hear additional ideas for community outreach.
- Announced reminders through social media
- Provided Spanish interpretation services during one in-person public meeting on April 7, 2022, and the online virtual public meeting on April 21, 2022 as recommended by the EJEAB.
- Prepared a hearing officer's report with responses to public comments as part of the hearing process which also addresses a recommendation from the EJEAB.

As noted above, The Division took additional actions in response to the recommendations from the NCDEQ Secretary's Environmental Justice and Equity Advisory Board (EJEAB) detailed in a [letter dated August 26, 2021](#).