CHAPTER I: MORRIS COUNTY'S AGRICULTURAL LAND BASE

Morris County is approximately 481 square miles, or 308,123 acres in total, and has approximately 11,600 acres of actively farmed land. In recent years, the farming community has experienced development pressures which threaten the loss of the existing agricultural landscape and by extension, the vitality of the farming industry. The County's Farmland Preservation Program has been successful, having preserved over 8,070 acres of farmland across 138 farms as of the writing of this plan. Farms in Morris County have been preserved through several programs, including Country, Non-Profit, Municipal and State Programs.

Several sources provide information regarding Morris County's agricultural statistics. The United States Department of Agriculture (USDA) Census of Agriculture utilizes a surveyed sample of the County's farmland owners and operators. Another source, Morris County tax assessment data, is based on information provided by landowners on farmland assessment forms, which represents their agricultural operations. The difference in methodologies makes it impractical to compare the data from one source to another, though both sources on their own provide valuable information regarding agriculture in Morris County.

Location and Size of Agricultural Base

According to 2021 tax assessment records, Morris County has approximately 30,605 acres of assessed farmland, making up 13 percent of the County's total land area. Of the County's 40 municipalities, 28 have farmland assessed property. The following chart details the number of acres of farmland per municipality in the County according to tax assessment records. These properties are tax assessed as 3A: Regular Farmland or 3B: Qualified Farmland. As demonstrated below, Washington Township has the most farmland in Morris County, comprising 35.6 percent of all farmland, followed by Chester Township and Mount Olive Township.

| Existing Farmland | | | | | | | |
|----------------------|----------|------------|--|--------------------|--------|-------|------------|
| Municipality | Acres | Percentage | | Municipali | ty | Acres | Percentage |
| Washington Township | 10,889.8 | 35.6% | | Lincoln Park | | 395.9 | 1.3% |
| Chester Township | 3,205.2 | 10.5% | | Pequannock Town | ship | 307.2 | 1.0% |
| Mount Olive Township | 2,748.1 | 9.0% | | Kinnelon | | 257.8 | 0.8% |
| Harding Township | 1,871.8 | 6.1% | | Chatham Townshi | р | 146.8 | 0.5% |
| Mendham Township | 1,758.8 | 5.7% | | Long Hill Township |) | 142.5 | 0.5% |
| Roxbury Township | 1,602.6 | 5.2% | | Chester Borough | | 108.4 | 0.4% |
| Jefferson Township | 1,464.7 | 4.8% | | Mine Hill Townshi | p | 75.8 | 0.2% |
| Rockaway Township | 1,278.7 | 4.2% | | Florham Park | | 44.8 | 0.1% |
| Mendham Borough | 1,101.9 | 3.6% | | Riverdale | | 35.9 | 0.1% |
| Boonton Township | 997.9 | 3.3% | | Wharton | | 23.2 | 0.1% |
| Montville | 682.0 | 2.2% | | Hanover Township |) | 19.6 | 0.1% |
| Morris Township | 539.5 | 1.8% | | Boonton | | 14.8 | 0.0% |
| Denville Township | 442.5 | 1.4% | | Mountain Lakes | | 9.6 | 0.0% |
| Randolph | 433.6 | 1.4% | | Butler | | 6.0 | 0.0% |
| Total | | Acres | | Percentage | | | |
| Total | | 30,605.57 | | | 100.0% | | |

Source: NJ 2021 Tax Assessment Data; acreages calculated in GIS

As shown on the following map, farms are primarily concentrated in the southwesterly portion of Morris County.

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In addition to tax assessment records, New Jersey Department of Environmental Protection's Land Use Land Cover (LULC) also provides a snapshot of existing land uses within the County. Using aerial photography and remote sensing technology, land use is categorized as either agricultural, barren land, forest, urban, water, or wetlands. As shown by the following table, urban and forested land are the most prevalent land use types in the County with nearly 80 percent of the County's total area; however, more than 11,600 acres of the County's total land is used for agricultural purposes.

| NJDEP 2015 Land Use Land Cover | | | | |
|--------------------------------|-----------|---------|--|--|
| Land Use | Acres | Percent | | |
| Agriculture | 11,601.1 | 3.8% | | |
| Barren Land | 2,584.6 | 0.8% | | |
| Forest | 118,383.6 | 38.4% | | |
| Urban | 121,385.1 | 39.4% | | |
| Water | 11,160.2 | 3.6% | | |
| Wetlands | 43,008.9 | 14.0% | | |
| TOTAL | 308,123.5 | 100.0% | | |

Source: NJDEP 2015 LULC, acres calculated in GIS

Differences in acreages between the LULC and the tax assessment data stem from the data source. As noted previously, the LULC is based on aerial photography and remote sensing technology, while the latter stems from digitized tax maps and tax assessment records. It should be noted that the LULC does not account for farmland that is forested or has wetlands; it is solely the area of land that is actively farmed. The following map, entitled "Land Use Land Cover (2015)," shows the locations of these land uses within Morris County.

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Soil Distribution and Types

An important consideration in farmland preservation is the quality of soils for agricultural production. The major advantages of prime agricultural soils are their fertility and lack of limitations for crop production purposes. Prime soils will support almost any type of agriculture common to this region. Soil limitations include steep slopes, extreme stoniness, or wetness, which may hinder cultivation. Prime agricultural soils produce superior crop yield on a consistent basis due to their high fertility content, when measured against those soils not rated as prime.

The soil data provided in this report is provided by the Natural Resources Conservation Service (NRCS) of the United Stated Department of Agriculture (USDA), which started conducting national soil surveys in 1935 and continues today. The farmland classification prescribed by NRCS identifies map units as prime farmland soils, farmland soils of statewide importance, farmland soils of unique importance, or other soils that are not suitable for agriculture. Farmland classification identifies the location and extent of most suitable soils for producing food, feed, fiber, forage, and oilseed crops. This identification is useful in the management and maintenance of the resource base that supports the productive capacity of American agriculture. Morris County has approximately 60,414 acres of prime farmland, 31,271 acres of soils of statewide importance, 12,925 acres of soils of unique importance, 8,814 acres of soils of local importance and 194,699 acres that are categorized as not prime soils.

The following table compares the total acreage of soil in Morris County to that of active farmland. The active farmland is derived from NJDEP's 2015 Land Use Land Cover classification for agriculture. As shown in the chart below, active farmland in Morris County consists of 60.7 percent prime farmland soils, 1.3 percent soils of statewide importance, 24 percent soils of local importance, and 13 percent soils classified as not prime. Explanations of the farmland classifications are provided below.

| Farmland Soils in Morris County | | | | |
|----------------------------------|-----------|------------|---------------------|------------|
| Soil Turne | Count | ty-wide | Active Agriculture* | |
| Son Type | Acres | Percentage | Acres | Percentage |
| Prime Farmland | 60,414.0 | 19.6% | 7,043.6 | 60.7% |
| Statewide Importance | 30,358.2 | 9.9% | 121.7 | 1.0% |
| Statewide Importance, if drained | 913.4 | 0.3% | 30.2 | 0.3% |
| Local Importance | 8,814.0 | 2.9% | 2,805.4 | 24.2% |
| Unique Importance | 12,924.8 | 4.2% | 97.1 | 0.8% |
| Not Prime Farmland | 194,699.2 | 63.2% | 1,503.0 | 13.0% |
| Total | 308,123.5 | 100.0% | 11,601.0 | 100.0% |

Source: USDA NRCS Web of Soil Survey, acreages calculated in GIS

* Based upon NJDEP 2015 Land Use Land Cover for agricultural lands

As shown on the following map, the majority of prime farmland soils are located within the southern portion of the County within Washington Township, Chester Township, Mendham Township, Mendham Borough, Harding Township, and Mount Olive Township. There are also prime farmland soils located along the eastern boundary of the County, however, these municipalities tend to consist of more urbanized development patterns and lack existing farmland.

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In addition to the Farmland Classification, soils also have an assigned non-irrigated land capability class. This classification system is based upon the capability of the soil to support development and agriculture. These Capability Classes are categorized on a scale of 1 through 8, with 1 having few limitations to restrict the use and 8 having the most restrictive limitations. The classes are defined as follows:

- 1. Class 1 soils have few limitations that restrict their use.
- 2. Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
- 3. Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.
- 4. Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.
- 5. Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- 6. Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- 7. Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
- 8. Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Further, the non-irrigated land capability class is also assigned a subclass, which is designated by adding a small letter, "e," "w," "s," or "c," to the class numeral. The letter "e" shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; "w" shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); "s" shows that the soil is limited mainly because it is shallow, droughty, or stony; and "c," used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry. Class 1 soils do not have a subclass, as there are few limitations.

The following section details each of the farmland classifications, as well as the land capability class for each soil unit within the county.

Prime Farmland Soils

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. SADC Prime Farmland Soils include all those soils in the USDA Land Capability Class I and selected soils from USDA Land Capability Class II. USDA Class I soils have slight limitations that restrict their use. USDA Class II soils have moderate limitations that reduce the choice of plants or require moderate limitations that reduce the choice of plants or require moderate conservation practices. SADC Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses.

The criteria for prime farmland designation include: an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few to no rocks. The water supply is dependable and of adequate quality.

Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slopes range from 0 to 6 percent.

According to the NRCS, some areas of prime farmland may require measures that overcome a hazard or limitation, such as flooding, wetness, and drought. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

According to the NRCS Web of Soils Survey, Morris County has 60,414 acres of soils that are considered Prime Farmland, as detailed in the following chart.

| Prime Soils | | | | |
|-------------|---|-----------------------------------|---------|------------|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage |
| AnoB | Annandale gravelly loam, 3 to 8 percent slopes | 2 e | 5,339.9 | 8.8% |
| BabA | Bartley loam, 0 to 3 percent slopes | 2 w | 579.0 | 1.0% |
| BabB | Bartley loam, 3 to 8 percent slopes | 2 e | 3,039.9 | 5.0% |
| BhnB | Birdsboro silt loam, 2 to 6 percent slopes | 2 e | 37.9 | 0.1% |
| BohB | Boonton moderately well drained gravelly loam, 3 to 8 percent slopes | 2 e | 1,002.3 | 1.7% |
| CakA | Califon loam, 0 to 3 percent slopes | 2 w | 1,361.7 | 2.3% |
| CakB | Califon loam, 3 to 8 percent slopes | 2 e | 3,902.0 | 6.5% |
| CanB | Califon gravelly loam, 3 to 8 percent slopes | 2 e | 952.4 | 1.6% |
| CapfB | Califon variant loam, 3 to 8 percent slopes | 2 e | 1,329.9 | 2.2% |
| EkhhB | Ellington loamy substratum variant fine sandy loam, 3 to 8 percent slopes | 2 w | 791.8 | 1.3% |
| GkaoB | Gladstone gravelly loam, 3 to 8 percent slopes | 2 e | 9,107.8 | 15.1% |
| HanB | Haledon silt loam, 3 to 8 percent slopes | 3 w | 4,486.3 | 7.4% |
| NekB | Neshaminy gravelly silt loam, 2 to 6 percent slopes | 2 e | 1,011.6 | 1.7% |
| NerB | Netcong gravelly sandy loam, 3 to 8 percent slopes | 2 e | 4,303.2 | 7.1% |
| PdtB | Pattenburg gravelly loam, 3 to 8 percent slopes | 2 e | 441.1 | 0.7% |
| РеоВ | Penn channery silt loam, 3 to 8 percent slopes | 2 e | 1,783.7 | 3.0% |
| PohA | Pompton sandy loam, 0 to 3 percent slopes | 2 w | 637.5 | 1.1% |
| PohB | Pompton sandy loam, 3 to 8 percent slopes | 2 w | 3,736.4 | 6.2% |
| RkrB | Riverhead sandy loam, 3 to 8 percent slopes | 2 s | 0.5 | 0.0% |
| RksA | Riverhead gravelly sandy loam, 0 to 3 percent slopes | 2 s | 361.3 | 0.6% |
| RksB | Riverhead gravelly sandy loam, 3 to 8 percent slopes | 2 s | 4,725.2 | 7.8% |
| RksnB | Riverhead variant gravelly sandy loam, 3 to 8 percent slopes | 2 s | 1,279.9 | 2.1% |
| RocB | Rockaway gravelly sandy loam, 3 to 8 percent slopes | 2 e | 2,172.1 | 3.6% |
| TurA | Turbotville loam, 0 to 3 percent slopes | 2 w | 1,190.4 | 2.0% |
| TurB | Turbotville loam, 3 to 8 percent slopes | 2 e | 2,927.9 | 4.8% |
| WadB | Washington loam, 3 to 8 percent slopes | 2 e | 1,132.7 | 1.9% |

| Prime Soils (Continued) | | | | |
|-------------------------|---|-----------------------------------|---------|------------|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage |
| WhpA | Whippany silt loam, 0 to 3 percent slopes | 2 w | 268.1 | 0.4% |
| WhpB | Whippany silt loam, 3 to 8 percent slopes | 2 w | 1,077.0 | 1.8% |
| WhphA | Whippany silt loam, sandy loam substratum, 0 to 3 percent slopes | 2 w | 528.5 | 0.9% |
| WhphB | Whippany silt loam, sandy loam substratum, 3 to 8 percent slopes | 2 w | 906.0 | 1.5% |
| | | 60,414.0 | 100.0% | |

Source: USDA Web of Soil Survey, acreages calculated in GIS

Soils of Statewide Importance

SADC Soils of Statewide Importance include those soils in the USDA Land Capability Class II and Class III that do not meet the criteria as SADC Prime Farmland Soils. USDA Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices. Class III soils have severe limitations that reduce the choice of plants or require special conservation practices, or both. These soils can economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields as high as SADC Prime Farmland if conditions are favorable. Criteria for defining and delineating this land are to be determined by the appropriate state agency or agencies. In some states, farmland of statewide importance may also include tracts of land that have been designated for agriculture by state law. Morris County has 30,358 acres of soils that are classified as being of Statewide Importance.

| Soils of Statewide Importance | | | | | |
|-------------------------------|--|-----------------------------------|---------|------------|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | |
| AnoC | Annandale gravelly loam, 8 to 15 percent slopes | 3 е | 1,037.5 | 3.4% | |
| AnoC2 | Annandale gravelly loam, 8 to 15 percent slopes, eroded | 3 e | 3.5 | 0.0% | |
| BacC | Bartley gravelly loam, 8 to 15 percent slopes | 3 e | 611.3 | 2.0% | |
| BohC | Boonton moderately well drained gravelly loam, 8 to 15 percent slopes | 3 е | 1,110.2 | 3.7% | |
| CakC | Califon loam, 8 to 15 percent slopes | 3 е | 993.9 | 3.3% | |
| ChrC | Chenango silt loam, 8 to 15 percent slopes | 3 е | 0.0 | 0.0% | |
| DufC2 | Duffield silt loam, 6 to 12 percent slopes, eroded | 3 е | 0.3 | 0.0% | |
| EkhhC | Ellington loamy substratum variant fine sandy loam, 8 to 15 percent slopes | 2 w | 933.5 | 3.1% | |
| GkaoC | Gladstone gravelly loam, 8 to 15 percent slopes | 3 е | 6,293.0 | 20.7% | |
| GkaoC2 | Gladstone gravelly loam, 8 to 15 percent slopes, eroded | 3 е | 124.2 | 0.4% | |
| HanC | Haledon silt loam, 8 to 15 percent slopes | 3 е | 789.7 | 2.6% | |

| Soils of Statewide Importance (Continued) | | | | | |
|---|---|-----------------------------------|---------|------------|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | |
| MenC | Meckesville moderately well drained gravelly loam, 6 to 12 percent slopes | 3 e | 5.6 | 0.0% | |
| NekC | Neshaminy gravelly silt loam, 6 to 12 percent slopes | 3 e | 1,341.1 | 4.4% | |
| NerC | Netcong gravelly sandy loam, 8 to 15 percent slopes | 3 e | 2,710.6 | 8.9% | |
| РаоС | Parker gravelly sandy loam, 3 to 15 percent slopes | 3 e | 8,668.3 | 28.6% | |
| PdtC | Pattenburg gravelly loam, 8 to 15 percent slopes | 3 e | 287.5 | 0.9% | |
| PeoC | Penn channery silt loam, 8 to 15 percent slopes | 3 e | 1,205.5 | 4.0% | |
| RerB7 | Reaville deep variant channery silt loam, 0 to 6 percent slopes | 4 w | 1,073.9 | 3.5% | |
| RksC | Riverhead gravelly sandy loam, 8 to 15 percent slopes | 3 e | 2,074.3 | 6.8% | |
| RocC | Rockaway gravelly sandy loam, 8 to 15 percent slopes | 3 e | 1,091.0 | 3.6% | |
| WadC2 | Washington loam, 8 to 15 percent slopes, eroded | 3 e | 3.3 | 0.0% | |
| | TOTAL 30,358.2 100.0% | | | | |

Source: USDA Web of Soil Survey, acreages calculated in GIS

The following chart details the soils which are of statewide importance if drained. These soils can be capable of producing yields as high as Statewide important soils when drained. The County has 913 acres of soil that are considered to be of Statewide importance if drained.

| Soils of Statewide Importance, if drained | | | | | |
|---|---|-----------------------------------|-------|------------|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | |
| BoyAt | Bowmansville silt loam, 0 to 2 percent slopes, frequently flooded | 6 w | 0.0 | 0.0% | |
| MknA | Minoa silt loam, 0 to 3 percent slopes | 3 w | 236.2 | 25.9% | |
| MknB | Minoa silt loam, 3 to 8 percent slopes | 3 w | 677.1 | 74.1% | |
| | | TOTAL | 913.4 | 100.0% | |

Source: USDA Web of Soil Survey, acreages calculated in GIS

Soils of Unique Importance

Unique soils are those soils other than prime farmland soils that are used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, and other fruits and vegetables. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California. Morris County has 12,925 acres of soils that are of unique importance.

| Unique Importance Soils | | | | | | | | |
|-------------------------|---|-----------------------------------|----------|-----------------------|--|--|--|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | | | | |
| AdrAt | Timakwa muck, 0 to 2 percent slopes, frequently flooded | 5 w | 3,460.8 | 26.8% | | | | |
| CarAt | Catden muck, 0 to 2 percent slopes, frequently flooded | 5 w | 7,522.4 | 58.2% | | | | |
| CatbA | Catden muck, 0 to 2 percent slopes | 5 w | 98.4 | 0.8% | | | | |
| PafAt | Natchaug muck, 0 to 2 percent slopes, frequently flooded | 5 w | 866.9 | 6.7% | | | | |
| WkkAt | Willette muck, 0 to 2 percent slopes, frequently flooded | 7 w | 976.1 | 7.6% | | | | |
| | | TOTAL | 12,924.8 | TOTAL 12,924.8 100.0% | | | | |

Source: USDA Web of Soil Survey, acreages calculated in GIS

Soils of Local Importance

Soils of local importance include those soils that are not prime or of Statewide importance and are used for the production of high value food, fiber or horticultural crops. In some local areas, certain farmlands are not identified as having national or Statewide importance. Where appropriate, these lands are identified by the local agency or agencies concerned as important to local agricultural production. These may also include tracts of land that have been designated for agriculture by local ordinance. Morris County has 8,814 acres of soil that are of local importance.

| | Soils of Local Importance | | | | | |
|--------|--|-----------------------------------|---------|------------|--|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | | |
| PbphAt | Parsippany silt loam, sandy loam substratum, 0 to 3 percent slopes, frequently flooded | 4 w | 8,813.9 | 100.0% | | |
| RorAt | Rowland silt loam, 0 to 2 percent slopes, frequently flooded | 2 w | 0.0 | 0.0% | | |
| | TOTAL | | | 100.0% | | |

Source: USDA Web of Soil Survey, acreages calculated in GIS

Not Prime Farmland Soils

Not prime farmland soils include those soils that are not prime farmland, not of statewide importance, not unique, or of local importance. These soils lack the physical and chemical characteristics which allow for agricultural crops to thrive. Not prime farmlands are listed below.

| Not Prime Farmland | | | | |
|--------------------|---|-----------------------------------|---------|------------|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage |
| AhcBc | Alden mucky silt loam, gneiss till substratum, 0 to 8 percent slopes, extremely stony | 7 s | 72.9 | 0.0% |
| BhdAt | Biddeford silt loam, 0 to 2 percent slopes, frequently flooded | 6 w | 3,253.4 | 1.7% |
| вохсс | Boonton and Haledon soils, 8 to 15 percent slopes, extremely stony | 7 s | 859.5 | 0.4% |
| CakBb | Califon loam, 0 to 8 percent slopes, very stony | 6 s | 3,773.9 | 1.9% |

| Not Prime Farmland (Continued) | | | | |
|--------------------------------|---|-----------------------------------|----------|------------|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage |
| CakCb | Califon loam, 8 to 15 percent slopes | 6 s | 759.4 | 0.4% |
| CanBb | Califon gravelly loam, 0 to 8 percent slopes, very stony | 6 s | 129.7 | 0.1% |
| ChkC | Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes | 7 s | 118.2 | 0.1% |
| ChkE | Chatfield-Hollis-Rock outcrop complex, New Jersey Highlands, 35 to 60 percent slopes | 7 s | 47.6 | 0.0% |
| CoaA | Cokesbury loam, 0 to 3 percent slopes | 4 w | 6.9 | 0.0% |
| CoaBb | Cokesbury loam, 0 to 8 percent slopes, very stony | 7 s | 156.1 | 0.1% |
| CoaBc | Cokesbury loam, 0 to 8 percent slopes, extremely stony | 7 s | 6,402.9 | 3.3% |
| CobA | Cokesbury gravelly loam, 0 to 3 percent slopes | 4 w | 2,110.6 | 1.1% |
| CobB | Cokesbury gravelly loam, 3 to 8 percent slopes | 4 w | 1,569.5 | 0.8% |
| CobBb | Cokesbury gravelly loam, 0 to 8 percent slopes, very stony | 7 s | 1.8 | 0.0% |
| CobBc | Cokesbury gravelly loam, 0 to 8 percent slopes, extremely stony | 7 s | 0.1 | 0.0% |
| EkhhD | Ellington loamy substratum variant fine sandy loam, 15 to 25 percent slopes | 2 w | 281.3 | 0.1% |
| FmhAs | Fluvaquents, loamy, 0 to 3 percent slopes, occasionally flooded | 3 w | 26.0 | 0.0% |
| FNAT | Fluvaquents and Udifluvents, 0 to 3 percent slopes, frequently flooded | 5 w | 5.9 | 0.0% |
| GkaoD | Gladstone gravelly loam, 15 to 25 percent slopes | 4 e | 2,138.1 | 1.1% |
| GKAPCC | Gladstone and Parker soils, 8 to 15 percent slopes, extremely stony | 7 s | 237.4 | 0.1% |
| HcuAt | Hatboro-Codorus complex, 0 to 3 percent slopes, frequently flooded | 5 w | 4,436.0 | 2.3% |
| HhmBc | Hibernia loam, 0 to 8 percent slopes, extremely stony | 7 s | 150.8 | 0.1% |
| HhmCa | Hibernia loam, 3 to 15 percent slopes, stony | 4 s | 10,089.7 | 5.2% |
| HhmDb | Hibernia loam, 15 to 25 percent slopes, very stony | 6 s | 619.0 | 0.3% |
| HncD | Hollis-Rock outcrop-Chatfield complex, New Jersey Highlands, 15 to 35 percent slopes | 7 s | 83.0 | 0.0% |
| HokCg | Holyoke silt loam, 0 to 15 percent slopes, rocky | 7 s | 674.3 | 0.3% |
| HomE | Holyoke-Rock outcrop complex, 15 to 45 percent slopes | 7 e | 789.2 | 0.4% |
| KkrE | Klinesville channery silt loam, 25 to 45 percent slopes | 7 e | 238.8 | 0.1% |
| NehDb | Neshaminy silt loam, 12 to 18 percent slopes, very stony | 6 s | 436.7 | 0.2% |
| OtsC | Otisville gravelly loamy sand, 3 to 15 percent slopes | 4 s | 2,403.0 | 1.2% |
| OtsD | Otisville gravelly loamy sand, 15 to 25 percent slopes | 6 s | 607.1 | 0.3% |

| Not Prime Farmland (Continued) | | | | | | | | |
|--------------------------------|---|-----------------------------------|----------|------------|--|--|--|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | | | | |
| PapD | Parker very gravelly sandy loam, 15 to 25 percent slopes | 4 e | 2,460.9 | 1.3% | | | | |
| ParC | Parker cobbly loam, 3 to 15 percent slopes | 4 s | 300.5 | 0.2% | | | | |
| ParD | Parker cobbly loam, 15 to 25 percent slopes | 6 s | 51.7 | 0.0% | | | | |
| ParEe | Parker cobbly loam, 18 to 40 percent slopes, extremely stony | 7 s | 180.3 | 0.1% | | | | |
| PauCc | Parker-Gladstone complex, 0 to 15 percent slopes, extremely stony | 7 s | 15,614.9 | 8.0% | | | | |
| PauDc | Parker-Gladstone complex, 15 to 25 percent slopes, extremely stony | 7 s | 8,534.0 | 4.4% | | | | |
| PawE | Parker-Rock outcrop complex, 25 to 45 percent slopes | 7 s | 6,530.1 | 3.4% | | | | |
| PbpAt | Parsippany silt loam, 0 to 3 percent slopes, frequently flooded | 5 w | 3,172.5 | 1.6% | | | | |
| PbtAt | Parsippany very poorly drained variant silt loam, 0 to 2 percent slopes, frequently flooded | 4 w | 0.0 | 0.0% | | | | |
| PgmD | Penn-Klinesville channery silt loams, 12 to 18 percent slopes | 4 e | 510.4 | 0.3% | | | | |
| PHG | Pits, sand and gravel | 8 s | 1,292.5 | 0.7% | | | | |
| PrkAt | Preakness sandy loam, 0 to 3 percent slopes, frequently flooded | 4 w | 3,595.8 | 1.8% | | | | |
| PrnAt | Preakness silt loam, 0 to 3 percent slopes, frequently flooded | 4 w | 44.8 | 0.0% | | | | |
| PrsdAt | Preakness dark surface variant sandy loam, 0 to 3 percent slopes, frequently flooded | 4 w | 1,276.9 | 0.7% | | | | |
| QY | Quarries | 8 s | 57.3 | 0.0% | | | | |
| RkgBb | Ridgebury stony loam, New Jersey Highlands, 0 to 8 percent slopes, very stony | 6 s | 2,595.5 | 1.3% | | | | |
| RkgBc | Ridgebury stony loam, New Jersey Highlands, 0 to 8 percent slopes, extremely stony | 7 s | 4,516.8 | 2.3% | | | | |
| RNAAC | Rock outcrop | 8 s | 574.0 | 0.3% | | | | |
| RNRE | Rock outcrop-Rockaway complex, 15 to 35 percent slopes | 8 s | 7,986.9 | 4.1% | | | | |
| RobCb | Rockaway sandy loam, 8 to 15 percent slopes, very stony | 6 s | 23,516.5 | 12.1% | | | | |
| RobDc | Rockaway sandy loam, 15 to 25 percent slopes, extremely stony | 7 s | 10,285.7 | 5.3% | | | | |
| RoefBc | Rockaway loam, thin fragipan, 0 to 8 percent slopes, extremely stony | 7 s | 25.5 | 0.0% | | | | |
| RoefCc | Rockaway loam, thin fragipan, 8 to 15 percent slopes, extremely stony | 7 s | 218.3 | 0.1% | | | | |
| RoefDc | Rockaway loam, thin fragipan, 15 to 35 percent slopes, extremely stony | 7 s | 132.0 | 0.1% | | | | |
| RokD | Rockaway-Chatfield-Rock outcrop complex, 35 to 60 percent slopes | 6 s | 345.9 | 0.2% | | | | |
| RomC | Rockaway-Rock outcrop complex, 8 to 15 percent slopes | 7 s | 6,794.4 | 3.5% | | | | |

| Not Prime Farmland (Continued) | | | | | | | |
|--------------------------------|---|-----------------------------------|-----------|------------|--|--|--|
| Symbol | Soil Description | Land Capability Classification | Acres | Percentage | | | |
| RomD | Rockaway-Rock outcrop complex, 15 to 25 percent slopes | 7 s | 5,551.3 | 2.9% | | | |
| RomE | Rockaway-Rock outcrop complex, 25 to 45 percent slopes | 7 s | 2,199.4 | 1.1% | | | |
| RooC | Rockaway-Urban land complex, thin fragipans, 0 to 15 percent slopes | 3 е | 24.8 | 0.0% | | | |
| RooD | Rockaway-Urban land complex, thin fragipans, 0 to 25 percent slopes | 4 e | 14.0 | 0.0% | | | |
| SweDc | Swartswood fine sandy loam, 15 to 25 percent slopes, extremely stony | 7 s | 0.2 | 0.0% | | | |
| UccAs | Udifluvents, 0 to 3 percent slopes, occasionally flooded | 2 w | 13.4 | 0.0% | | | |
| UdaB | Udorthents, 0 to 8 percent slopes, smoothed | 3 w | 1.5 | 0.0% | | | |
| UdkttB | Udorthents, loamy fill substratum, 0 to 8 percent slopes | 3 w | 1.8 | 0.0% | | | |
| UdrB | Udorthents, refuse substratum, 0 to 8 percent slopes | 7 s | 797.4 | 0.4% | | | |
| UR | Urban land | 8 s | 6,840.0 | 3.5% | | | |
| URPOMB | Urban land, Pompton substratum, 0 to 8 percent slopes | 8 s | 0.1 | 0.0% | | | |
| URWETB | Urban land, wet substratum, 0 to 8 percent slopes | 8 s | 554.6 | 0.3% | | | |
| USCHRC | Urban land-Chatfield-Rock Outcrop complex, 0 to 15 percent slopes | 8 s | 0.6 | 0.0% | | | |
| USGKAC | Urban land-Gladstone complex, 8 to 15 percent slopes | 8 s | 1,371.1 | 0.7% | | | |
| USHALB | Urban land-Haledon complex, 3 to 8 percent slopes | 8 s | 2,891.6 | 1.5% | | | |
| USNESB | Urban land-Neshaminy complex, 0 to 8 percent slopes | 2 s | 628.5 | 0.3% | | | |
| USPENB | Urban land-Penn complex, 0 to 8 percent slopes | 8 s | 536.6 | 0.3% | | | |
| USPREB | Urban land-Preakness complex, 0 to 8 percent slopes | 8 s | 396.9 | 0.2% | | | |
| USRHVB | Urban land-Riverhead complex, 3 to 8 percent slopes | 8 s | 10,028.3 | 5.2% | | | |
| USROCC | Urban land-Rockaway complex, 3 to 15 percent slopes | 8 s | 7,717.6 | 4.0% | | | |
| USROCD | Urban land-Rockaway complex, 15 to 25 percent slopes | 8 s | 612.7 | 0.3% | | | |
| USWHHB | Urban land-Whippany, occasionally flooded complex, 0 to 8 percent slopes | 8 w | 906.2 | 0.5% | | | |
| WATER | Water | | 9,572.8 | 4.9% | | | |
| WhvAb | Whitman cobbly loam, New Jersey Highlands 0 to 3 percent slopes, very stony | 5 s | 944.6 | 0.5% | | | |
| WuoBc | Wurtsboro silt loam, 0 to 8 percent slopes, extremely stony | 7 s | 0.1 | 0.0% | | | |
| | | TOTAL | 194,699.2 | 100.0% | | | |

Irrigation and Water Resources

Irrigation can be used by farmers to create viable agricultural land that would otherwise be unsuitable for intensive crop production. Irrigation transports water to crops to increase yield, keeps crops cool under excessive heat conditions, and can be used to prevent freezing.

Although natural precipitation can provide some water for agricultural operations, it does not provide a consistent supply of water to sustain farming activities. As a result, farmers must adopt irrigation practices based on their farm's location and surrounding environment. The most common sources of irrigation include:

- Drilling wells and pumping water from the ground. This method is regarded as the most popular technique, but is also the costliest.
- Farm pond irrigation method. This technique captures surface water from the surrounding area. In areas where the water table is very close to the surface, it taps into the groundwater.
- Pumping water from a stream. Farmers may adopt this method if their farmland is close to streams, lakes, and rivers.
- Farmers can then choose between different methods of irrigation, including sprinkler or drip irrigation systems. Generally, drip irrigation systems are thought to be the more efficient method. The following table represents the number of farms and acres irrigated within Morris County, based on U.S. Census of Agriculture data.

Morris County communities rely on both surface and ground water supply sources for their water needs. Surface water supplies are derived from some reservoirs, lakes and streams situated throughout the County. The majority of water supply is derived from groundwater resources. subsurface sources are obtained from fractured rock aquifers such as the Igneous and metamorphic, Jacksonburg Limestone, Kittatinny Supergroup, and Hardyston Quartzite, and Rocks of the Green Pond Mountain Region, Kittatinny Mountain, and Minisink Valley in the westerly portion of the County, and the Basalt and Brunswick Aquifer in the easterly portion.¹

| Morris County Irrigated Farms & Acreage 1987-2017 | | | | | | | |
|---|-------|----------|-------|----------|--|--|--|
| Year | Farms | % Change | Acres | % Change | | | |
| 1987 | 66 | - | 483 | - | | | |
| 1992 | 64 | -3.0% | 566 | 17.2% | | | |
| 1997 | 79 | 23.4% | 865 | 52.8% | | | |
| 2002 | 87 | 10.1% | 855 | -1.2% | | | |
| 2007 | 78 | -10.3% | 1,006 | 17.7% | | | |
| 2012 | 99 | 26.9% | 726 | -27.8% | | | |
| 2017 | 121 | 22.2% | 1,707 | 135.1% | | | |

Source: Census of Agriculture

Statistics and Trends

Historically, roughly 80 percent of Morris County has been classified as either forest or urban land according to NJDEP Land Use Land Cover data. From 2002 to 2015, the County experienced an overall loss of 1,700 acres of agricultural land or 12.8 percent between 2002 and 2015, while urban land increased by 8,149 acres or 7.2 percent. The following table details the changes in the land use classification of Morris County from 2002 to 2015.

¹ Aquifers of New Jersey by Herman et al, NJGS, NJDEP, 1998. https://www.state.nj.us/dep/njgs/pricelst/ofmap/ofm24.pdf

| Morris County Land Use Land Cover 2002-2015 | | | | | | | | | | |
|---|---------|---------|---------|---------|---------|---------|---------|---------|-------------------|---------|
| Land Use | 2002 | | 2007 | | 2012 | | 2015 | | Change: 2002-2015 | |
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent |
| Agriculture | 13,302 | 4.3% | 12,733 | 4.1% | 11,749 | 3.8% | 11,601 | 3.8% | -1,700.7 | -12.8% |
| Barren Land | 3,432 | 1.1% | 2,710 | 0.9% | 2,540 | 0.8% | 2,585 | 0.8% | -847.5 | -24.7% |
| Forest | 123,769 | 40.2% | 119,133 | 38.7% | 118,819 | 38.6% | 118,384 | 38.4% | -5,385.3 | -4.4% |
| Urban | 113,236 | 36.8% | 119,137 | 38.7% | 120,749 | 39.2% | 121,385 | 39.4% | 8,149.3 | 7.2% |
| Water | 10,645 | 3.5% | 11,303 | 3.7% | 11,347 | 3.7% | 11,160 | 3.6% | 514.9 | 4.8% |
| Wetlands | 43,740 | 14.2% | 43,108 | 14.0% | 42,920 | 13.9% | 43,009 | 14.0% | -730.7 | -1.7% |
| TOTAL | 308,124 | 100.0% | 308,124 | 100.0% | 308,123 | 100.0% | 308,124 | 100.0% | - | |

Source: NJDEP Land Use Land Cover; acreages calculated in GIS

Number of Farms and Farm by Size

According to the U.S. Agriculture Census, the number of Morris County farms has fluctuated since its peak in 1987. The number of farms hit a low point in 2012 at 366; however, as of 2017 the number of farms rebounded to 418.

| Number of Morris County Farms | | | | | | | |
|-------------------------------|--------|----------|--|--|--|--|--|
| Year | Number | % Change | | | | | |
| 1987 | 430 | - | | | | | |
| 1992 | 395 | -8.1% | | | | | |
| 1997 | 383 | -3.0% | | | | | |
| 2002 | 407 | 6.3% | | | | | |
| 2007 | 422 | 3.7% | | | | | |
| 2012 366 | | -13.3% | | | | | |
| 2017 | 14.2% | | | | | | |

Source: U.S. Census of Agriculture

The size of farms has fluctuated since 1987, likely due to subdivisions occurring within the county's municipalities and being developed or converted into other land uses. Farms that are between 1 to 49 acres have experienced an increasing trend since 1987. In 1987, there were 297 farms within this size range, and by 2017, there were 341 farms, representing an increase of 44 farms. Farms in the 50 to 499 acres category experienced a continuous decrease since 1987, when there was a total of 126 farms. As of 2017, there were only 73 farms remaining within this size range, representing an overall decrease of 53 farms. Large farms greater than 500 acres have remained low, ranging from as many as nine in 1992 to as little as three in 2002 and 2012.

| Morris County Farms by Farm Size | | | | | | | | |
|----------------------------------|--------|----------|--------|----------|------------|----------|--|--|
| Year | 1-49 | acres | 50-49 | 9 acres | 500+ acres | | | |
| | Number | % Change | Number | % Change | Number | % Change | | |
| 1987 | 297 | - | 126 | - | 7 | - | | |
| 1992 | 293 | -1.35% | 93 | -26.19% | 9 | 28.57% | | |
| 1997 | 282 | -3.75% | 94 | 1.08% | 7 | -22.22% | | |
| 2002 | 314 | 11.35% | 90 | -4.26% | 3 | -57.14% | | |
| 2007 | 346 | 10.19% | 69 | -23.33% | 7 | 133.33% | | |
| 2012 | 289 | -16.47% | 74 | 7.25% | 3 | -57.14% | | |
| 2017 | 341 | 17.99% | 73 | -1.35% | 4 | 33.33% | | |

Source: US Census of Agriculture

Average & Median Farm Size

Morris County farm sizes have been on a downward trend since their peak in 1987, when the average farm size was 63 acres. Farm size decreased over the past 30 years to 35 acres in 2017, representing a 55 percent drop. Median farm size was not collected until 1997, but its patterns mirror that of the average size, representing a loss of 71 percent.

| Average and Median Farm Size in Morris County | | | | | | | |
|---|-------|--------------|------------------|----------|--|--|--|
| Year | Avera | ge Farm Size | Median Farm Size | | | | |
| | Acres | % Change | Acres | % Change | | | |
| 1987 | 63 | - | - | - | | | |
| 1992 | 61 | -3.17% | - | - | | | |
| 1997 | 58 | -4.92% | 17 | - | | | |
| 2002 | 42 | -27.59% | 16 | -5.88% | | | |
| 2007 | 40 | -4.76% | 13 | -18.75% | | | |
| 2012 | 40 | 0.00% | 13 | 0.00% | | | |
| 2017 | 35 | -12.50% | 12 | -7.69% | | | |

Source: U.S. Census of Agriculture