Identifying Farmland for Preservation in Cumberland County New Jersey

Advanced GIS Course (ENVL3303)
Instructor, W. Fan
Ursula Patroni
Environmental Studies Program, Richard Stockton College of New Jersey

Abstract

The purpose of this project was to identify farmland in Cumberland County that has not been preserved, and then rank the unpreserved farmland based on current preservation criteria. A currently preserved farmland map was obtained from the Cumberland County Agriculture Development Board, and using this map and recent land use, land cover data, the unpreserved farmland was identified. The identified farmland was then ranked using the preservation ranking criteria currently in use by the Cumberland County Agriculture Development Board. This project was successful in that, unpreserved farmland was identified, and this farmland was ranked appropriately. The results from this project can be used to identify unpreserved farmland in Cumberland County that should be preserved immediately and can be used as a guideline for identifying farmland eligible for preservation based on its preservation importance rank.

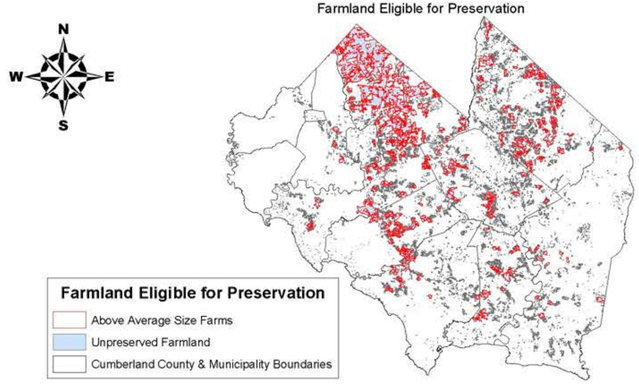
Objective

The two objectives of this project were: to geographically identify unpreserved farmland in Cumberland County based on defined geographic criteria and to rank the identified farmland based on preservation importance using the current ranking system. The three main geographic criteria used in determining eligibility are: soil quality, acreage, and land use or land cover bordering the farm.

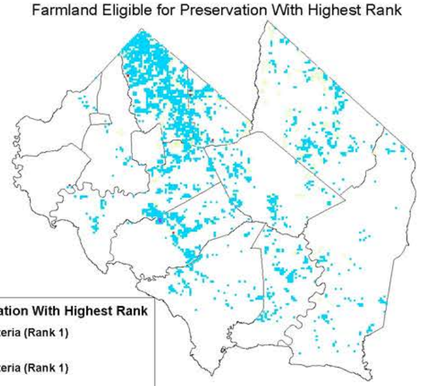
Introduction

The New Jersey Farmland Preservation Program was authorized in 1999 and relies heavily on preservation goals of state, county, and municipal government. The Program has one main geographic goal, which includes emphasis on preserving significant areas of contiguous farmland to promote the long-term viability of agriculture as an industry. Cooperation between municipal and county government and individual farm owners is essential to achieving the main, and secondary goals of the Program. Currently, the main preservation method consists of farm owners applying for enrollment in the Program. Due to this voluntary approach, highly endangered farms are not currently preserved. Using the GIS approach to identify farms eligible for preservation is a more progressive and accurate approach to farmland preservation. It can facilitate the preservation of farmland that may or may not have been previously identified or considered for preservation and can aid landowners and government in making more informed preservation decisions.

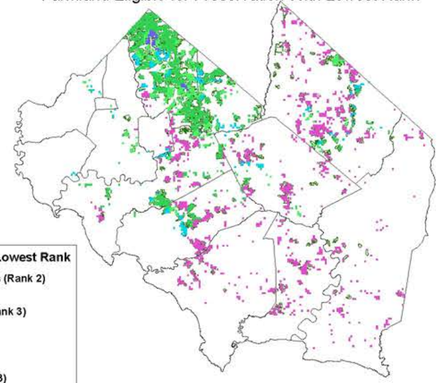
Farmland Eligible for Preservation



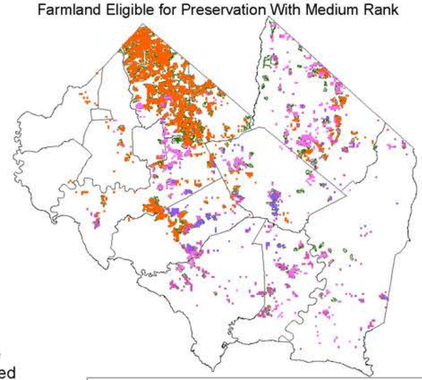
Farmland Eligible for Preservation With Highest Rank



Farmland Eligible for Preservation With Lowest Rank



Farmland Eligible for Preservation With Medium Rank



Methodology

The data needed for this project included: Cumberland County and Municipality boundaries; land use and land cover data from 1992; and Cumberland County roads, which were obtained from the Stockton database, and soils data and a map of currently preserved farmland, which were obtained from the Cumberland County Agriculture Development Board. The first step of this project was to identify the farmland in Cumberland County using the land use, land cover data. Then the currently preserved farmland was removed from the total farmland in Cumberland County. The unpreserved, above average size farmland and farmland with appropriate soil quality were also identified since these are two of the main criteria. The next step was to identify farm borders that influence preservation rank. Forest, wetlands, areas of commercial and industrial land use, and high and low intensity residential development areas were identified using the land use, land cover data. The roads data and the currently preserved farmland were also considered in this step. These farm borders were converted to distance maps with five distinct areas of distance from each feature: 0 - 1/4 mile; 1/4 - 1/2 mile; 1/2 - 3/4 mile; 3/4 - 1 mile; and > 1 mile. Based on farmland preservation criteria, farmland within 2640 ft. of roads, commercial/industrial land use, and high intensity residential areas were removed from the unpreserved farmland. The removal of this ineligible farmland resulted in the map of farmland eligible for preservation. Next, farmland within any distance of all important borders including low intensity residential development, preserved farmland, wetlands, and forest was identified. This resulted in the map of farmland eligible for preservation with the highest rank. The farmland within the five distance categories from each border feature was then identified resulting in the maps of farmland eligible for preservation with medium and lowest ranks. As is delineated by all four maps, the greatest concentration of farmland eligible for preservation is in the North and West areas of the county.

0 140 280 560 Miles

Conclusion

Based on the results of this project, farmland eligible for preservation is plentiful and includes farmland with high preservation importance. Although there is not much farmland that meets all preservation criteria simultaneously, there is a multitude of farmland with a medium rank that is relatively contiguous to currently preserved farmland and/or low intensity residential development, and meets the acreage, soil, and border criteria. The farmland with the highest rank should be preserved in the near future and the farmland with medium rank should be priortized as well. The farmland with the lowest rank should also be preserved but with emphasis on using these areas as landmarks for future preservation. The results of this project coincide with the main goal of the New Jersey Farmland Preservation Program and support the use of GIS to identify farmland eligible for preservation, that is not currently preserved. Although the results of this project are successful for these reasons, they could have been more accurate with the availability of a tax parcel map for Cumberland County and the use of a Cumberland County zoning map. The tax parcel map for Cumberland County is under development and would have provided ownership information for the eligible farmland. This information can act as a catalyst for the Program since specific landowners can be approached and informed about the preservation importance of their land. A zoning map could have provided information useful to eliminating farmland not eligible for preservation if it is not located in an agricultural zoning area. The incorporation of the missing elements of this project in the future use of GIS in farmland preservation will further support the importance of GIS to farmland preservation and will increase the accuracy and rate of preservation.