Background

Massachusetts (MA) has seen a 29% decline in farmland since 1997, making it critical for the remaining farmland in MA to be protected against long-term trends of farm land to development (NUTR 231, 2017). Berkshire County, located in western MA has experienced a 36% decline in farmland between 2002 and 2017 (USDA, 2018a). A 30% of farmers in Berkshire County are 65 years of age or older (USDA, 2019). Retiring farmers must decide what to do with farmland-many choose to sell their land to developers for finance. The Massachusetts Department of Agricultural Resources developed the Agricultural Preservation Restriction (APR) program in 1997 to offer non-development alternatives to owners of agricultural land with the goal of promoting productive agricultural land from development for non-agricultural purposes, increasing access to farmland for beginning farmers, and assisting aging farmers with estate and retirement planning (NUTR 231, 2019).

Agricultural conservation easements are deed restrictions placed on property to protect resources, such as productive farmland, and are non-development development alternatives to owners of agricultural land. Easements are a critical tool for farmland protection and can be flexible to meet the needs of individual farmers. Criteria considered for identifying farmland to put under agricultural easements differ based on location and purpose. One criteria that is consistently considered high priority is whether the land is considered to be the ‘Prime Farmland’, defined by the USDA as having a combination of physical and chemical characteristics that make it a high productivity area (USDA, 2000). Some conserve conservation programs focus on areas with a high level of development threat. Factors that contribute to high development threat include growing population density and high land value, which attract developers to purchase land for nonagricultural uses. In contrast, other conservation programs prioritize maintaining larger regions, or clusters of, agricultural land. For example, the state of Connecticut’s conservation program prioritizes farms with greater agricultural production and value in proximity to other agricultural land, currently conserved land, or farms services (Bassani, Coffin and Mitasch, 2015).

The goal of this project is to offer two scenarios for how MA state and local government and non-profits could go about identifying farmland to prioritize for agricultural conservation easements in Berkshire County. These scenarios reflect different goals for farmland conservation in MA, one that aims to protect farmland under high threat of development and the other to protect farms in regions with larger areas of ongoing agricultural development and lower threat of development. Based on these two scenarios, the project aims to identify geographic areas of priority for farmland conservation efforts in Berkshire County which can be used to guide local conservation groups for farmland easement decision-making.

Methods


Figure 4. Property Value of Agricultural Land 2018. Based on these percentages, I then used the field calculator to find the percent change in agricultural land from 2008 to 2018, seen in Figure 2.

To identify the prime agricultural areas, I used the NCRS 2010/2012 soil maps, selected to identify the polygons within Berkshire County, and acquired this layer. I then joined this soils polygon layer with the soils soil Map Mutisn table on the NCRS database to identify areas of prime farmland based on the importance and Farmland of Statewide Importance. For the land values, I selected each block group with high land values and high population density through the Analytic Hierarch Priority Calculator (Goepel, 2019). Figures 6 and 7 show the weighted scores for each of the two scenarios. Figure 8 shows the percent agricultural land in 2018. Based on these percentages, I then used the field calculator to find the percent change in agricultural land from 2008 to 2018, seen in Figure 2.

In order to find a scoring weight for each scenario, I took five criteria layers and converted all vector data to raster data. I completed the analysis in the ArcMap ArcInfo Spatial Analyst program, based on the original projection for the Cropland data and data layer which is the basis of the analysis. I then calculated each layer with scores from 0-3 based on each scenario. For Scenario 1, the layers were the state of Connecticut’s conservation program prioritizes farms with greater agricultural production and value in proximity to other agricultural land, currently conserved land, or farms services (Bassani, Coffin and Mitasch, 2015).

Based on the eligibility criteria for APR conservation easements and additional criteria for the farmland preservation programs in Berkshire County, the following criteria were considered for this study. I developed two scenarios for prioritizing farmland for conservation in Berkshire County. Scenario 1 prioritizes conservation activities on areas of land more vulnerable to development and aims to maintain open space in more densely populated areas. Scenario 2 prioritizes farmland under a lower threat of development and thus more likely to remain as working land in the future. Here I am identifying land under low threat as areas of ongoing agricultural activity and gains in in farmland, lower real estate values and areas of lower population density. This second scenario works under the assumption that it is more effective to lose long-term to keep farmland elsewhere, prioritizing larger agricultural areas that allow for resource sharing and proximity to farm services. Both scenarios are based on 5 criteria: the percent of land in agricultural use in 2018; the percent change in agricultural land from 2008 to 2018; farmland type; land value, and population density.

Results

Figure 8 and 9 show the results for identifying towns to prioritize for agricultural conservation easement in each scenario. Scenario 1 identifies the towns of Mount Washington, Stockbridge, New Stockbridge, Stockbridge, Salisbury, Richmond, Lenox, Pittsfield, Dalton, Channing, Williamsburg, and Cheshire as high priority for agricultural conservation easement activity. Scenario 2 identifies Sheffield, Staniford, Stockbridge, Becket, Richmond, Adams and Florida in high priority. While Scenarios 1 and 2 have different goals, there are areas of overlap. In both counties Richmond and Stockbridge are identified as high priority areas.

Conclusions

The scenarios for prioritization of farmland for conservation easements presented here offer two paths forward. The results in Figures 8 and 9 can be used by decisionmakers at MA Department of Agricultural Resources and local conservation groups to make funding decisions to continue their work of farmland protection in Berkshire County. While Figures 8 and 9 may be helpful for decisionmakers to initially identify towns to prioritize for funding, as shown are the individual parcel level. In this case, Figures 6 and 7 may be particularly useful for decisionmakers. Parcels can be viewed through the map layers and more detailed priority score can be used to assess and compare individual parcels. Additionally, Figure 5 can be used to identify areas that offer the highest priority score at the parcel level to evaluate individual parcels. However, a limitation of this project is that the results, based on the criteria for the two scenarios, offer somewhat opposing models for conservation. To further this research, and develop a scalable model to evaluate the priority for assessment at the individual farm level, one scenario must be chosen to use in practice. If decisionmakers in MA clearly define their priorities for farmland protection going forward, one of these scenario could be further developed to specific goals for farm and foster support in Berkshire County. Assessing the priorities are consistent across the state, this model could then be applied to all of MA. For example, in some conservation programs land renewable practices, farm production value, and age of the current farmer are important criteria for identifying farms for easement. Feedback is needed from local conservation groups to select and further develop the best model.