



Farmland Preservation Comprehensive Report

For presentation to the *Chatham County Soil & Water Conservation District*

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Table of Contents

Executive Summary	iii
About the Authors	v
Introduction	1
Methodology and Implementation	2
Survey Methodology.....	2
Interview Methodology.....	3
Limitations.....	4
Summary of Findings	5
Survey Findings:.....	5
Interview Findings:.....	8
Synthesized Findings:.....	10
Summary of Recommendations and Next Steps	13
Operational Capacity: Dedicated Staff and Easement Monitoring.....	13
Individualized Funding Strategies.....	13
Alternatives to Easements.....	14
Community Engagement.....	15
Conclusion	16
Appendix A: Executive Summary of Interviews	17
Durham County Interview Summary.....	17
Wake County Interview Summary.....	20
Halifax County Interview Summary.....	23
Lincoln County Interview Summary.....	25
Cabarrus County Interview Summary.....	27
Mecklenburg County Interview Summary.....	30
Appendix B: Survey	33
Appendix C: Interview Protocols	40
Appendix D: Literature Review	43
Introduction.....	43
Historical Context Of Farmland Preservation.....	43
Funding Mechanisms for Farmland Preservation.....	44
Buffer Zones.....	46
Best Management Practices.....	46
Appendix E: Survey Report	47
Appendix F: Map	53
Works Cited	55

Executive Summary

North Carolina, according to the American Farmland Trust, is projected to lose about 1.2 million acres of farmland by 2040, making it second in the United States only to Texas in terms of projected land loss (Sallett, 2020). Even so, North Carolina has historically had a strong presence of farming communities and of agricultural production. A major housing shortage and economic pressure has influenced many farmers to sell their land, leading to vast residential and commercial development. While a need exists to increase the amount of affordable housing available in North Carolina, state and county governments and private entities have begun developing policies to ensure that some amount of farmland will be preserved as well.

Our team conducted a statewide policy survey regarding whether counties had an established farmland preservation program or were seeking to establish one, as well as what challenges or successes they had encountered during this process. Our goals were to consolidate information regarding county efforts for farmland preservation in the state as well as to recommend some best practices for counties seeking to establish programs.

We received responses from 29 counties out of the 100 counties in North Carolina, which was distributed through the NC Division of Soil and Water Conservation as well as individually to all county officials publicly linked to farmland preservation. This was done to encompass individuals in county departments outside of SWCD, including but not limited to Planning or Parks and Recreation. We then conducted interviews with six of the 21 responding counties with established farmland preservation programs, including Durham, Wake, Halifax, Cabarrus, Lincoln, and Mecklenburg.

Counties with farmland preservation programs often seek to aid landowners in the process of conservation easement application and establishment, as well as seeking to promote education and to engage in other land protection. Many of these counties also have established Voluntary Agricultural Districts that can support farmers with cost-share resources and certain legal protections. It is common for counties to operate their farmland preservation program through their county's Soil and Water Conservation District.

Our team found that conservation easements were the most common mechanism utilized, though not the only means by which to accomplish farmland preservation, Urban development was most often cited as the greatest threat to farmland preservation. Rising land prices have placed stress on easement funding systems, as the amount of funds needed for an easement is directly related to land value. The Agricultural Development Fund Program (ADFP) was most commonly cited as the main source of conservation easement funds, though highly competitive, but other land

trusts and conservation funds may also administer grants. Landowners with more sentimental value to their land or a family legacy of farming were most interested in applying for a conservation easement. Counties often cited lack of funding or staffing as primary challenges for expanding their efforts in farmland preservation, as well as citing the difficulty of navigating the easement process, which includes a lengthy application and review timeline and high transaction costs.

Our recommendations include addressing operational capacities wherever possible, meaning that a greater number of dedicated county staff to farmland preservation may provide county officials with more time for grant applications and fundraising for these efforts. Easement monitoring, often completed by the county, is essential to maintain the spirit and purpose of the easement, with a potential for violations especially as land is inherited by future generations or sold with the easement in place. In terms of competition for funding, there is currently an uneven distribution in North Carolina, whereby urban areas are advantaged in the application process, despite higher land costs, due to higher risks of development. Rural areas are less competitive. Rural areas do still maintain some easements, especially where protecting the land holds a special environmental value to the county or where part of the land was donated. This means that farmland preservation programs tend to be more robust in urban areas, where the issue of farmland loss is more salient. Community engagement is essential to promote community-based solutions, like education, linking agriculture and local food banks, and protecting community lands. Community outreach is also crucial to gauging easement interest and monitoring easements once in place.

Our project recognizes that establishing easements and attaining easement funding is not feasible for all small or rural farmers. We offer community engagement in terms of support for farmers as an alternative to easements when necessary. By supporting income for farmers rather than simply focusing on land preservation, there may be fewer economic pressures on farmers to sell their land. Strategies include encouraging opportunities for agritourism, instilling community partnerships such as those seen with local food banks or local education programs, as well as other unique solutions specifically targeted at small farmers or rented farms, which often do not qualify for broader state or federal financial support.

About the Authors

This report was authored by a team of six undergraduate seniors in the Public Policy department at the University of North Carolina at Chapel Hill: Brody Milotte, Faith Mynheer, Chase Pierce, Lillian Propst, Henning Schroeder, and Aaron Scott. This project was completed as the final component of the Public Policy capstone requirement. The team partnered with Dr. Andrew Waters, Farmland Preservation Coordinator of the Chatham County Soil and Water Conservation District in North Carolina. The team was supervised by Teaching Assistant Professor Dr. William Goldsmith.

Introduction

Farmland preservation is an increasingly critical issue across North Carolina, where urban expansion and resource limitations challenge the sustainability of agricultural landscapes. There is currently an affordable housing crisis in North Carolina that has created high demands for residential development, with vast commercial development driving economic pressures in some North Carolina counties as well. This has driven many farmers to sell their farmland to developers. Meanwhile, rising land values have constrained existing farmland preservation funding mechanisms.

By 2040, North Carolina is expected to lose about 11% of its current farmland. However, farmland loss has been a longstanding problem in the state. Between 2001 and 2016, for example, the American Farmland Trust cites that North Carolina lost about 732,000 acres of agricultural land to development, with 387,000 acres of this land deemed ‘nationally significant’, meaning this land was best suited for growing food and crops (Sallett, 2020).

There are many motivations for farmland preservation, including agriculture presenting a necessary food source, having scenic value, or being viewed as a legacy or a heritage, especially in rural or farming communities. Repercussions of farmland loss include impacts on local economies with histories of agricultural production, loss of environmental benefits, and a decrease in food security. Agritourism and outdoor recreation are other motivations for seeking farmland preservation policies.

In the face of rising development and a housing shortage, farmland preservation must consider best strategies for balancing various economic pressures and stakeholders. In this portfolio, we present our research regarding existing farmland preservation programs in North Carolina, best strategies, motivations, challenges, and our recommendations for county officials seeking to establish or to further develop farmland preservation programs.

Methodology and Implementation

Survey Methodology

The Farmland Preservation Survey was developed to assess the current state of farmland preservation programs, the challenges faced by North Carolina counties, and the best practices employed by Soil and Water Conservation Districts (SWCDs). The survey was structured into two primary sections: quantitative questions and qualitative questions. Quantitative questions included multiple-choice and ranking-based formats to gather numerical and categorical data, while qualitative questions provided open-ended opportunities to explore barriers, motivations, and resource needs related to farmland preservation. The survey instrument was carefully designed in consultation with county officials in charge of farmland preservation programs and our policy instructor.

The target population included all 100 counties in North Carolina with SWCDs or other departments that handle preservation efforts. A purposive sampling approach was used to capture responses from counties with varying levels of farmland preservation activity, including those with active programs, interest in initiating programs, and limited or no programs. In total, 29 counties participated, representing a diverse mix of urban, suburban, and rural areas. This ensured the survey captured a broad spectrum of experiences and perspectives. The survey was distributed electronically through Qualtrics, with follow-up reminders to encourage participation.

The questionnaire included 20 items grouped into thematic sections, covering topics such as program characteristics, easement practices, stakeholder engagement, challenges and risks, and resource needs. Key areas of focus included identifying gaps in program coverage, assessing funding adequacy and mechanisms, understanding landowner motivations, examining easement practices, and addressing challenges such as urban development, rising land values, and generational farming engagement. The survey also sought to uncover training and capacity-building priorities, such as easement negotiation, grant writing, and public outreach strategies. Closed-ended questions provided predefined response options to streamline analysis, while open-ended questions allowed for detailed insights into nuanced county experiences.

Data were analyzed using both quantitative and qualitative methods. Quantitative responses were aggregated and summarized with descriptive statistics to identify trends and common practices, while qualitative responses were subjected to thematic analysis to extract insights on barriers, innovative strategies, and resource gaps. Despite its strengths, the methodology had certain limitations. Not all counties participated, potentially skewing results toward those more actively

engaged in farmland preservation. Responses relied on self-reporting by county representatives, which may have introduced biases. Additionally, the limited time frame for data collection may have constrained participation.

Overall, the survey provided a comprehensive understanding of farmland preservation across North Carolina counties. By capturing diverse perspectives, it highlights significant challenges such as funding limitations, urban development pressures, and generational shifts in farming. At the same time, it underscores the critical need for enhanced training, better funding mechanisms, and increased support for program implementation. These findings form a valuable foundation for informing policy recommendations and program enhancements aimed at ensuring sustainable farmland preservation efforts statewide.

Appendix C contains the full farmland preservation survey, including all questions posed to participating counties. It is important to note that not all questions were answered by every county, as some were conditional based on prior responses.

Appendix E provides a comprehensive survey report, detailing responses to all questions and summarizing key insights from the short-answer responses. These highlights offer valuable takeaways and further contextualize the survey findings.

Interview Methodology

We selected a mix of urban and rural counties in various geographic areas with established programs to contact out of those counties which responded to the survey. We requested an interview with thirteen of these counties via email. We also requested an interview with two counties seeking to establish a program who completed the survey.

For the purpose of our project, we did not include counties which identified as having an established program but which do not have conservation easements in their county. This applies to three counties that completed the survey. We eliminated these counties from interviews primarily because the established farmland preservation program in their responses seemed to be primarily run by outside entities, such as state or federal agencies (i.e. the USDA Farm Agency). State and federal government agencies, as well as land trusts and other private entities, may collaborate with county governments, but programs housed outside of local government fall outside the scope of this project.

We conducted five interviews via Zoom and one by phone, with two members of the team on almost all interviews (one recording and taking notes during the conversation, and the other asking questions). We used an established protocol for all interviews, including questions related to the interviewee's background, their county's goals and progress related to farmland preservation, their policies and strategies, their capacities and resources, threats to farmland

preservation, and their final thoughts. We also included follow-up based on their survey responses. At their discretion, some interviewees chose to provide us with additional resources and documentation regarding their county's policies and progress.

We completed interviews with all counties that responded to our interview request. Below we provide some key trends in our interview responses, as well as general summaries for each interview. The counties are as follows: Durham, Wake, Halifax, Lincoln, Cabarrus, and Mecklenburg. All of these counties have some form of an established farmland preservation program. Appendix A includes a summary of each of these interviews.

Appendix B includes our interview protocol. We used this protocol as a template for all interviews, but personalized some questions for each county according to the county's survey responses.

Limitations

We acknowledge that we have a relatively low number of counties interviewed. There may be response bias with regards to those counties which opted to interview and those who completed the survey. We unfortunately were not able to include any counties without an established farmland preservation program. We also acknowledge that the flooding from Hurricane Helene made contact with some Western North Carolina counties difficult. We did not include any Western NC counties in the interview, though we did receive some responses from these counties in the survey. These counties, at the time of the interview, were facing very limited access to the internet among other hardships caused by the devastation of severe flooding.

Summary of Findings

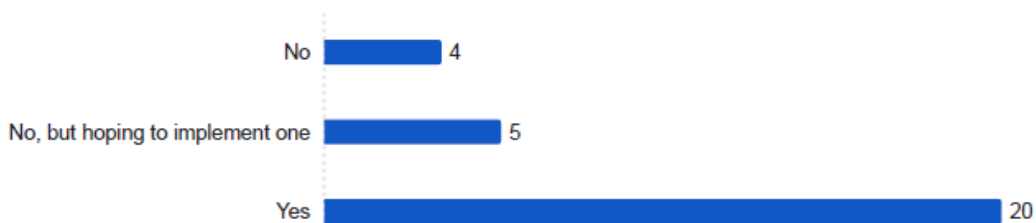
Survey Findings:

The Farmland Preservation Survey Report provides insight into the current state and challenges of farmland preservation across North Carolina counties. Out of the 29 counties, 20 counties that responded to the survey do have formal farmland preservation programs, five showed interest in developing initiatives, and four indicated they did not plan on developing any initiatives. Soil and Water Conservation Districts are often responsible for preservation activities, though dedicated resources and staff remain limited. Counties face significant challenges, with urban development and funding shortfalls as the leading obstacles. While financial incentives and legacy concerns drive landowner participation, the lack of stable, sufficient funding constraints efforts. Many counties struggle to balance the rising demand for easements with available resources, and fewer than half can offer financial aid for transaction costs. Survey responses reveal a need for enhanced prioritization tools, educational outreach, and training resources on easement legalities, grant applications, and landowner engagement. Overall, while the survey highlights considerable interest and effort in farmland preservation, it also underscores a pressing need for increased funding and programmatic support to ensure sustainable preservation efforts.

Key Takeaways:

1. **Prevalence of Farmland Preservation Programs:** Nine of the counties surveyed do not have a formal farmland preservation program in place, though many express interest in developing one.

Does your county have an existing farmland preservation program?



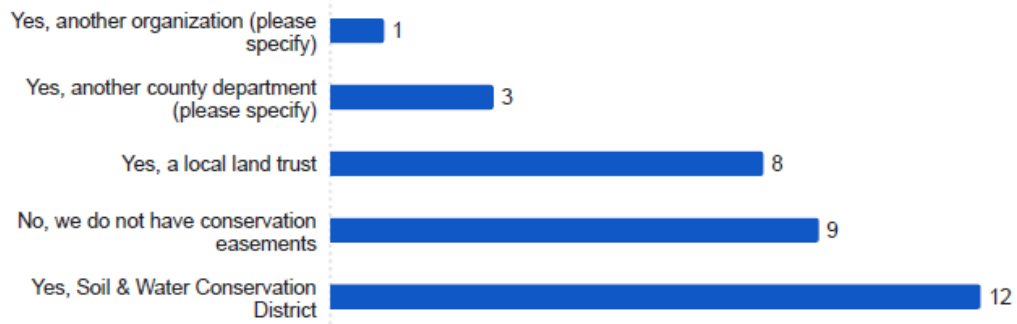
2. **Staffing and Responsibility:** Soil and Water Conservation Districts handle farmland preservation efforts in the majority of counties, with only a few counties designating full-time staff.

If you have dedicated staff for farmland preservation, are they full-time or part-time?



- Conservation Easement Enforcement: Many counties rely on local land trusts or Soil and Water Conservation Districts to enforce conservation easements; however, several counties lack established protocols for monitoring or defense.

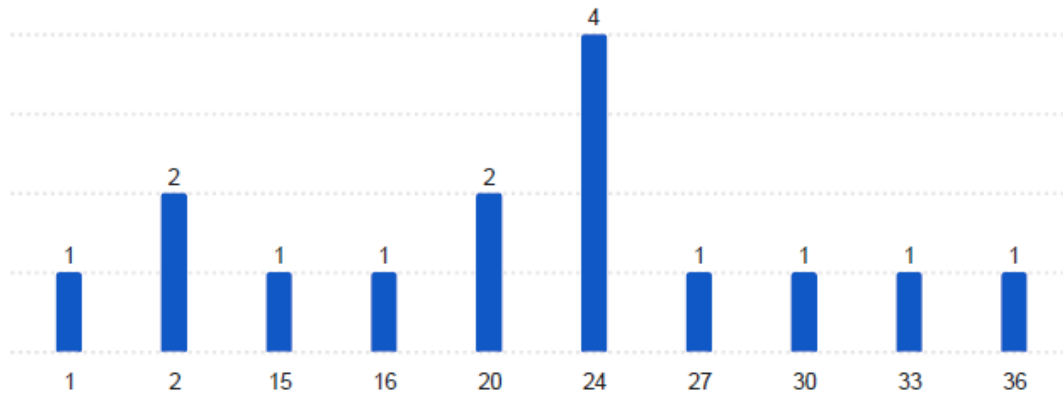
Does your county have an organization that handles the enforcement of conservation easements?



Respondents who selected 'another organization' or 'another county department' specified entities such as Energy and Environmental Services.

- Easement Closure and Funding: Conservation easement closures vary widely in duration, reflecting differences in funding availability and procedural complexity.

Average number of months to close a conservation easement



- Landowner Participation Factors: The primary motivations for landowner participation include legacy/heritage preservation, financial incentives, and environmental concerns.

What do you think is the primary factor influencing landowner participation in farmland preservation programs in your county?



Respondents who selected 'Other' cited various factors, including input from children and family, conservation considerations, uncertainty, land rights, and general knowledge.

- Challenges to Farmland Preservation: Urban development and funding limitations are the most significant risks to preserving farmland, with counties noting a shortage of financial support to meet growing interest.

What do you see as the largest risk to farmland preservation efforts in your county?



Respondents who selected 'Other' highlighted concerns related to future owners and land value, the low incentives for rural farmers, state-wide pooling, and a combination of all these factors.

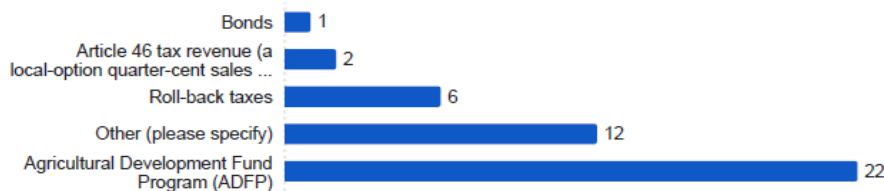
- Financial Assistance: Only about one-third of counties provide financial assistance to cover landowner transaction costs, and those that do often reimburse costs post-expense.

Do you provide financial assistance to landowners for transaction costs?



- Funding Sources: Many counties depend on Agricultural Development Fund Programs (ADFP) and other local or state sources, though funding remains inconsistent and often insufficient.

What is your county's source of funding for conservation easements?

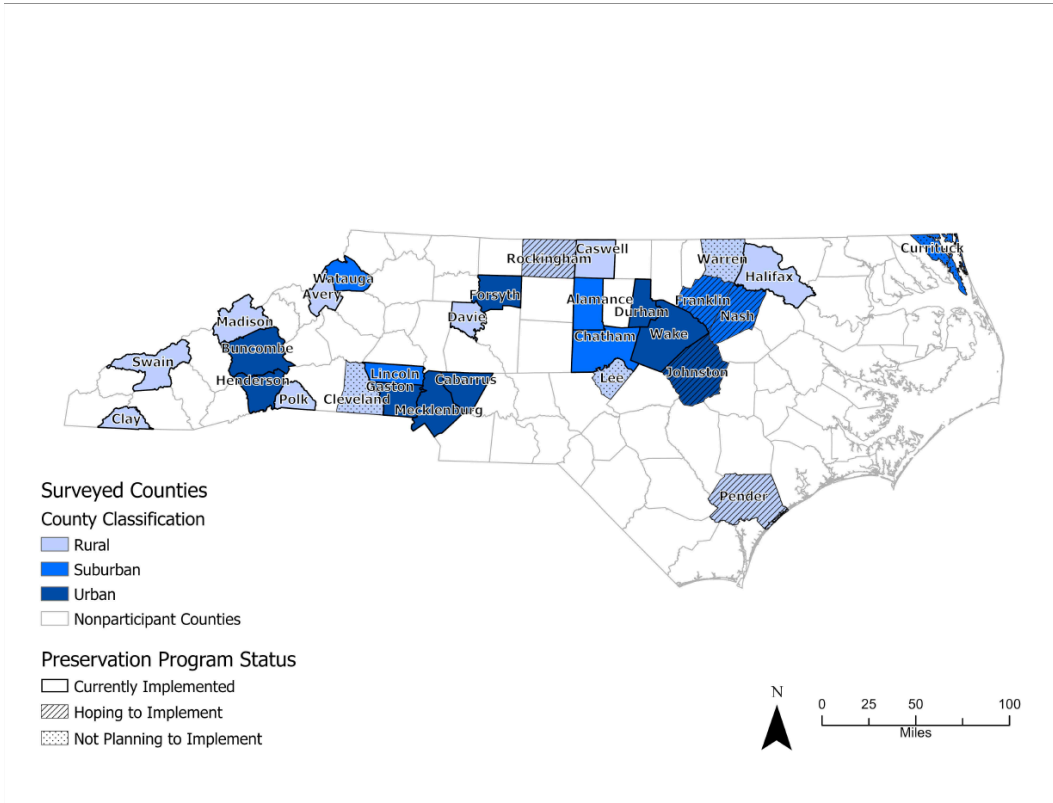


Respondents who selected 'Other' provided a range of responses, including none, capital funds, land trusts, NRCS-ALE grants, undetermined factors, private entities, USDA-ALE, county funds, N/A, and annual budget allocations.

Interview Findings:

- Five out of six counties house their farmland preservation programs under Soil and Water Conservation.
 - Wake, Halifax, Lincoln, Cabarrus, and Mecklenburg all have their farmland preservation programs under SWCD. Mecklenburg is the only county out of these with their SWCD separate from the county. Durham's farmland preservation program is located in the Open Space and Real Estate division under the department of Engineering and Environmental Services.
- Three of these counties (about half) have a staff member dedicated to farmland preservation.
 - Wake, Mecklenburg, and Durham all have staff members primarily dedicated to farmland preservation. Lincoln, Halifax, and Cabarrus all have staff members tasked primarily with soil and water conservation. These counties will respond to easement interest and applications but do not advertise these services. Halifax County remains involved in the easement process but refers easement applicants to outside services.
- All counties cited staffing and funding constraints as major challenges to farmland preservation efforts.
 - Only three of the six counties we interviewed had dedicated farmland preservation staff: Mecklenburg, Durham, and Wake. In the rural counties, including Lincoln, Cabarrus, and Halifax, SWCD officials had little to no designated funding for farmland preservation funding outside of easement funding that can be attained through the ADFP. This means that the county is limited in its ability to aid farmers with transaction costs for those interested in easements, or have other allocated funds for alternative programs to support farmers and farmland. These individuals also have other responsibilities related to soil and water conservation, which can limit these officials' time and capacity for pursuing farmland preservation or monitoring easements.
- Five out of the six counties hold or monitor land easements.
 - Mecklenburg was the only county not currently monitoring conservation easements. Of those counties which shared easement numbers, Lincoln County monitors one easement, Halifax County monitors five easements, and Durham County monitors nineteen easements.
- Easements tend to range from 2-7 years from the beginning application to the closing of easements.
 - Easement processes of up to seven years were mentioned by Lincoln. Wake and Cabarrus has had easement processes that have taken as long as six years. Halifax has one easement currently in progress that is in its second year of the application process.

- All counties cite that older landowners tend to be more interested in farmland preservation, especially if they hold a sentimental value for their land.
- Four of the counties cited increased education regarding land preservation and farm support overall as crucial to their cause.
 - Mecklenburg County is working on having farms that are open to teaching others to farm, like veterans or individuals with disabilities, as well as instilling farm visits, community gardens, etc. in the school system. Cabarrus, Lincoln, and Halifax discuss cost-share meetings as a means to educate farmers about their financial options, including easements. Wake and Durham feel that landowners are generally aware of easements and their counties' program, but maintain close relationships with landowners even so.
- All those counties which monitor easements do so at least annually, either by site visits or aerial imaging.
 - Durham County does biyearly site visits but uses frequent aerial imaging. Halifax County is working on implementing aerial imaging. The other counties do frequent site visits.
- The most common concern for farmers interested in the process of easements is the financial consequences and potential benefits.
- Transaction costs can present a major barrier to farmers applying for conservation easements.
 - Specifically, Lincoln County does not receive county funding to cover a large part of the transaction costs for easement application. This means that applying for an easement requires a \$10-\$15,000 initial investment by the farmer.



We created a color-coded map to illustrate the distribution of surveyed counties across urban, suburban, and rural classifications. This geographic breakdown helps reveal patterns in farmland preservation practices and challenges unique to each category. For instance, urban counties like Durham and Wake often face intense pressure from rapid development, while rural counties like Swain and Polk grapple with challenges such as limited resources and competing land uses. The map also incorporates textures to indicate the status of farmland preservation programs: counties with established programs, those planning to implement a program, and those with no current plans for implementation.

Synthesized Findings:

In our administration of both the survey and the subsequent interviews, our team observed some key themes appearing across both research instruments.

The most foundational issue represented in our data was the prevalence of urban sprawl and its effects. Twenty of 29 counties surveyed identified urban development as the biggest threat to farmland preservation efforts within their county, while all of the interview respondents mentioned urban sprawl as a consideration in the future planning of their farmland preservation programs. As demands for affordable housing increase, populations rise, and urban areas are successful in their farmland preservation programs, this pushes developers and residents to

nearby counties to search for or to develop housing. This also impacts the value of land in nearby counties, placing pressure on farmers to sell, and pressure on the county to develop to meet these housing needs.

One of the impacts of urbanization has been the increase in land prices as a result of increased competition for development. This issue will likely intensify as North Carolina's population is projected to increase by another 3.5 million by 2050, according to the North Carolina Office of State Budget and Management. The increase in land prices correlates with an increase in the amount of grant funding preservation officials must raise to fund easements, which are based on land value. Easements generating a net positive economic impact become increasingly difficult with development-caused rising land costs. Amy Cook of Cabarrus County Soil and Water noted that it can be hard to get landowners to “say no to big numbers”- a summary of one of the biggest challenges addressed by farmland preservation officials.

In addition to rising costs associated with easement values, competitive, limited sources of funding exacerbate the strain placed on preservation budgets. This combination of limited available funding and an increasing threat of farmland loss is especially concerning to the goal of maintaining agricultural production in the state.

Officials noted that staffing constraints could make monitoring easements difficult, especially if the number of easements is to rise to meet farmland preservation goals. Transaction costs were also listed as a barrier to entry for farmers looking to pursue easements. Without county funding dedicated to cover expenses, farmers looking to apply for an easement can face an initial investment of 10-15,000 dollars, according to officials interviewed in Lincoln County.

While these constraints pose financial challenges for preservation officials, the logistical difficulties inherent in the current easement process pose limitations on officials' ability to pursue preservation efforts. The variation in the timeline between easements and bureaucratic inconsistencies among different levels of government represent significant barriers for program expansion. For example, to attain federal funding for conservation easements, one must first attain state funding. This process was outlined briefly by the interviewed officials in Lincoln County. Requirements for state and federal funding are often different, and both may be subject to change. The length of the easement process, which all interviewed counties holding easements stated ranged from 2-7 years, present the possibility that changing requirements would further raise transaction costs or cause an easement application to be disqualified from funding consideration. This can sometimes result in the cancellation of easement applications, or cause the landowner or county to pay for new appraisals, legal help, etc. For these reasons, county officials do not advise all farmers or landowners to engage in conservation easements. Funding received from easements can be used to further invest in or sustain the farm, but for those in urgent need of financial help, development sales may be the only available remedy due to the

policy landscape of farmland preservation overall. While this is an important context to acknowledge, we note that recommendations for reconciling state and federal funding processes or for addressing timeline or transaction concerns fall outside the scope of this project.

Summary of Recommendations and Next Steps

Operational Capacity: Dedicated Staff and Easement Monitoring

Dedicated staff and legislative support would lend further resources to easement monitoring and enforcement and policy implementation. In both the survey and the interview results, only about half of the counties with an established farmland preservation program had a designated staff member for farmland preservation. While county funding and commitment is crucial to expanding staff for farmland preservation, greater dedicated staff for farmland preservation may enable staff to engage in more grant application and research to fund farmland preservation, to maintain outreach to farmers and discuss cost-share options and farming support, including conservation easements, and to present and implement unique solutions for the county to preserve farmland.

Responding counties did not cite prevalent easement violations. The counties that do enforce easements complete frequent site visits, maintain close contact to land owners, and/or complete aerial imaging to ensure that easement requirements are adhered to. The majority of these easements, however, are still in the first generation of the established easement, meaning the landowner currently holding the land is the landowner that chose to apply to and enroll in the easement. This means that it is unclear what violations will occur as the land is inherited by future generations or sold with the easement restrictions in place. As these challenges may emerge, there is a needed capacity for designated entities to address potential easement violations in order to maintain effective perpetual easements. At present, the limitations of staff that many counties are experiencing may directly impact the counties' ability to monitor and enforce easements once in place, a limitation that must first be addressed before the number of effective easements in a given county should increase.

Individualized Funding Strategies

It is essential that staff are able to understand and tailor their funding strategies to their counties. In the current funding landscape, the majority of easement funding is provided by the ADFP, which must be granted at the state level before federal funding may be sought. These easement funding application processes are hyper-competitive, and include in their rankings factors relating to land value, amount of donation, land use, and risk of land to urban development. This thus advantages urban counties in pursuit of easement funding, in areas where land cost is often higher. In urban areas, land loss tends to be more salient. This means rural or suburban areas may face risks of urban development due to urban spillover but also face increased barriers for easement funding, leading to an uneven distribution in the state and gaps in funding for certain areas. While county support is more prevalent in urban areas, this makes local funding and fundraising especially crucial to farmland preservation programs in rural areas. Local strategies

may be most effective in rural areas to reduce transaction costs, and research and engagement with third parties may provide avenues to engage in further cost-share with farmers interested in easements. The most successful rural easements in the application process for funding are often those with a land donation at least in part, which cost-share programs or unique grants could facilitate.

Alternatives to Easements

While conservation easements are largely effective, there is a gap inherent in the current conservation easement process. Some farmers are able to cover transaction costs, be competitive in the easement process, and ultimately receive funding for conservation easements. There are many small, lower-income farmers, however, that would not have the financial resources or flexibility to enter and complete the easement process. Many small farms or farmers that rent land to farm do not qualify for existing financial support, which often comes in the form of state or federal subsidies for agricultural production. These are the farmers that exist in many, especially rural, North Carolina counties. For these farmers to avoid pressures to sell, they must have community support and generate sufficient income, a goal that could be aided by many unique, community-based solutions.

There is a belief among many that we interviewed or surveyed that increasing the viability of farming may further the goals of farmland preservation rather than merely land preservation overall. The distinction between farmers and landowners was mentioned by several counties interviewed. Some farmer support programs may be alternatives to conservation easements, which have strict requirements regarding land use. These programs may be relevant to sustaining agriculture overall. In this section, we acknowledge the limitations of conservation easements and encourage community efforts.

Beyond conservation easements, in counties such as Mecklenburg, there is evidence of education programs linked to providing tourism and field trip opportunities to support farmer income. There are established links between agricultural production and local food banks, to provide consistent income to farmers and consistent access to food for food insecure populations within the area. There are also goals to utilize existing farmers and community-owned land to teach individuals to farm and to reduce the financial barriers for individuals to begin farming. As this program has not yet been implemented, its results cannot be analyzed in this report.

Cost-share and future land planning are other potential policies. Halifax County cited the Keep the Farm workshop, which focuses on cost-share options and discusses will-writing and legal needs of farmers, rather than conservation easements as the only land-planning or financial assistance option. All counties interviewed acknowledged the idea that conservation easements are not feasible nor desirable for all farmers, yet it is important that these farmers' needs are met so that they can sustain their farms as well.

Community Engagement

Land conservancies and local governments play a vital role in farmland preservation, both in funding mechanisms and in monitoring and enforcement of conservation easements. The Natural Resources Conservation Service (NRCS) and Agricultural Conservation Easement Program provide a funding match, but only if a local partner exists who can both match funding and enforce conservation easements. Local organizations also play an outsized role in outreach and communication with local farmers. Staff of land conservancies and farmland preservation programs build relationships with local farmers to create conservation easements. Many farmers may be apprehensive to enroll in conservation easement programs due to high capital costs associated with inspections and regulatory requirements; local engagement can overcome this barrier to easement establishment. It can encourage farmers to enroll in the program with the promise of future monetary benefit. Additionally, communication between land conservancies and local farmland preservation programs can provide monetary benefits through land swaps and cooperation for easement enforcement and inspections. The Triangle Land Conservancy covers six counties in North Carolina and regularly engages in land swaps with local governments to financially benefit both partners. Increasing community engagement between farmers, land conservancies, and local governments would work to increase monetary benefit to all partners and increase the acreage under conservation easement.

Counties widely recognize the need for enhanced tools, greater educational outreach, and dedicated training on easement procedures, grant applications, and landowner engagement strategies. Third parties and cross-county collaboration can also provide opportunities to train and educate officials looking to establish programs on the easement process or other farmland preservation policies.

Conclusion

The survey analysis, alongside in-depth interviews, offers a comprehensive look at current preservation efforts across North Carolina counties, highlighting both achievements and ongoing struggles. Key findings emphasize the pivotal role of financial incentives and the deep-rooted legacy concerns that drive landowners' interest in preservation. However, limited financial resources and high transaction costs remain substantial barriers, complicating counties' abilities to meet the demand for conservation easements. Urban sprawl, increased development, and increasing land values both constrain and necessitate farmland preservation programs. Ultimately, this portfolio underscores that while counties are committed to preserving farmland, their success will largely depend on increased funding and programmatic support to create sustainable, impactful programs capable of protecting North Carolina's agricultural heritage for future generations.

County level officials tend to be the closest to the landowners and to the issue of farmland loss in their own communities. Farmland loss remains a significant issue in North Carolina, which affects the availability of agricultural land for the future, the viability of farming, and the volume of agricultural production overall, thereby creating economic, environmental, and social impacts. However, as the establishment of farmland preservation programs is fairly new, there is much to be learned from studying the efforts of various counties at achieving this goal. Our team believes that there are opportunities for future research in terms of the number of easement violations that arise in second or third generations of landowners and the methods by which counties holding these easements seek to redress these. Other research opportunities exist in terms of the effectiveness of programs aimed at increasing the number of farmers in a community, the long-term effects of community partnerships with small farmers without easements on avoiding the sale of their farmland, and the long term effects of conservation easements overall on farmland preservation.

A great portion of this paper is dedicated to the challenges and shortfalls that county officials face in seeking to establish farmland preservation programs. There are inherent limits on county officials completing this work. There are also reasons to take a broader view of this work across numerous counties, as action by one county can sometimes encourage spillover effects into other counties without wider collaboration. Even so, the efforts and progress by the county officials that we interviewed and surveyed have been great. Despite these challenges, our team believes that progress can continue to be made by county officials in achieving this significant goal of farmland preservation. With rising development, the calls for farmland preservation only gain in urgency. Agricultural land changed to commercial or residential use very rarely can be changed back (Sallett, 2020). Thus, it is crucial that efforts are made to counter the loss that threatens all farmland, while preservable farmland still exists.

Appendix A: Executive Summary of Interviews

Durham County Interview Summary

Interview Date: 10/21/2024

Interviewers: Faith Mynheer, Lillian Propst (recorder)

Interviewee: Celeste Burns

Contact Information: cburns@dconc.gov

Role: Open Space and Real Estate Manager

Department: Engineering and Environmental Services, Open Space and Real Estate Division

Key Takeaways:

Durham County is unique among many other North Carolina counties with an established farmland preservation program. This is because Durham County has both a longstanding program and houses this program in its own department division outside of Soil and Water Conservation. This program consists of open space land protection, with both conservation lands and farmland through acquisition of land and easements, which was originally housed in the Planning Department, but moved to the County's Engineering and Environmental Services Department in the early 2000s. Durham County's first farmland easement was Herden Hills Farm in 2001. Durham County's farmland preservation program is reflected in Durham County's 2009 Farmland Protection Plan ordinance, which is currently being revised as part of the update to the Farmland Protection Plan, currently in process and funded by the NC ADFP. A copy of this policy was provided to us by Celeste Burns, along with a document displaying the acreage and location of all of Durham County's current easements, and a document outlining the policy impacts of Durham County's Protection of Working Conservation Lands, as of September 2024. The Farmland Protection Advisory Board (FPAB) is a citizen committee that also provides support and guidance for this work.

Celeste has a background in natural resources, a Masters in Forestry, an inactive real estate license, experience in land management and conservation, and has completed a few legal courses. Celeste is the Open Space and Real Estate Division Manager of Durham County, and her job consists, in part, of maintaining all Working Land Easements. She collaborates with the Durham County Soil and Water Conservation District staff, including Sherry Scully, who monitors stream easements and provides staff support to the County's Farmland Protection Advisory Board.

Durham County typically budgets \$500,000 for Open Space Conservation and Working Lands. Celeste's is a county staff position with about 1 additional FTE working on farmland protection. Allocated funds for open space are used for surveys, to apply for grant funds, for appraisals, etc. Celeste expressed that this money is used to leverage additional grant funds for habitat, water quality, and resource protection as well as farmland (and forestland) protection. She believes there are advantages to having an established program outside of Soil and Water, as this enables more specialization for each department and fewer administrative or electoral barriers for the administration of Open Space and Working Land funds. She does, however, work closely with the SWCD as well as with the Planning Department in Durham County.

Most Durham County-held easements are Working Land Easements, where the land is owned by private landowners. Landowners have the right rather than the obligation to farm land under an easement. Durham County also has separate lands that they own and maintain primarily as conservation lands, some with public access for low-impact recreation. Durham County has only one municipality, which is the city of Durham. The City and County, through the 2023 Comprehensive Plan, recently adopted a policy to protect 30% of land in the county, including land permanently protected for habitat and land protected by easement. Easements require a permanent commitment to the government and a permanent obligation.

Durham County has received funding from the USDA-FRPP, most recently ACEP ALE, NC Clean Water Management Trust Fund, the City of Raleigh's and City of Durham's Watershed Protection Programs, NC ADFP, Army National Guard (Camp Butner) and others. They partner with the Triangle Land Conservancy and Eno River Association, non-profit land trusts working in Durham County. To date, Durham County has spent about 33 cents for every \$1 of value to protect land. In some cases, landowners donate land or part of the easement value.

The major limiting factor of Durham County's farmland protection work is staff capacity. They currently only have two full-time staff working on farmland protection. Their largest farm protected is a 900-acre farm; however, the average acreage of an easement in this county tends to be 40-50 acres. Protection reasons include water quality, wildlife, ecotourism, and protecting future lands which could be farmed. Durham is a relatively small county, and many owners of larger parcels are aware of the county's farm and open space protection work. Durham County feels that there is a general understanding of what easements are due to the longevity of their program. Rather than learning about the program from the government, landowners often become interested in easements due to talks with neighbors or other landowners. The majority of the work in Durham County is done in Northern Durham, where land tends to be less expensive and there is more of a history of agricultural and forestry uses.

Another important consideration for Durham County in this work is using county resources wisely and equitably. In Durham County, they have four minority-owned farms protected by County-held working lands easements, which represents about 25% of farmland protection projects. Durham County acknowledges that supporting farmland and farmers are often two separate things. For example, those who farm the land are often not those who own the land. Further, Durham County considers future uses of land, in that they hope to preserve a diversity of land with at least some agricultural production, rather than having all land preserved being large estates, horse farms, or other types of land which are not used for agricultural production.

Durham County has a well established easement stewardship and monitoring program centered on open communications with easement landowners. They complete annual reports in compliance with easement requirements. Celeste believes that frequent landowner communications help deter any easement violations. Durham County has high resolution aerial imagery updated quarterly and reviews to ensure that no construction or significant change in land use has occurred without notification.

Wake County Interview Summary

Interview Date: 10/24/2024

Interviewers: Aaron Scott, Henning Schroeder (recorder)

Interviewee: Loren Hendrickson

Contact Information: loren.hendrickson@wake.gov

Role: Farmland Preservation Coordinator

Department: Soil and Water Conservation District

Key Takeaways:

Loren Hendrickson is the Farmland Preservation Coordinator for Wake County, NC. With a background in Economics and Sustainability, Loren began working for the Wake County Soil and Water Conservation District in 2022. His primary responsibilities relate to easement management on all levels, including engagement, documentation, and securing funds. Grant application and administration constitute his primary tasks, especially as it can be difficult to raise the necessary funds that easements require. Wake County's primary goal is to close on perpetual easements to secure long-term preservation for qualified properties, thus ensuring properties cannot be subdivided and must be used for agricultural purposes only. VADs support demands for short-term, non-binding preservation. Short-term easements can positively impact delaying and stunting urban sprawl in regions of rapid development. However, these easements can lack enforcement mechanisms, as enforcement may cause an expedited sale of that land if a landowner fears intervention. Despite Loren's focus on perpetual easements, the varying stages of current easement applications can stunt overall progress. Loren is often faced with multiple challenges at any given time, as landowners interested in easements face a long process and often external pressure.

While these logistical concerns remain, community engagement has been strong in Wake County. With VADs and Enhanced VADs working to gain the interest of landowners and consider more permanent conservation options, Loren maintains a focus on cultivating personal relationships with community members to build public trust regarding their organization. This can be useful in facilitating conversations regarding the value that landowners place on their land, and what easements may entail. Loren feels that advising useful land management, working in the field alongside farmers, and imploring proper agricultural practices are ways for these relationships to start. He notes that there can sometimes be a sentiment regarding a lack of government trust in these processes, as landowners can feel that such agreements deprive them of their autonomy in regards to their land. Thus, it can be beneficial for them to have a

relationship with a non-regulatory agency that can work in an advisory capacity that provides support to them. Word-of-mouth by landowners who have gone through the easement process is also a great source of trust among the farming community with regards to this process. Press and publicity from closed projects greatly benefits these programs and can generate traction for those interested in learning more.

Fielding new landowners who want to put their land into conservation easements is also an involved process. There are numerous factors to consider when deciding whether to apply for an easement, with the biggest factor often being financial support. Appraisal for land is often much higher than what can be paid by the county to sign this land into an easement. This information is vital for consideration both in the process and by the landowner, however, as restrictions imposed by easements tend to decrease property value. Wake County uses their number of acres and the number of farms preserved or existing as metrics for their success in farmland preservation. There are currently 350 acres of permanently protected lands in Wake County. Loren has worked in the past with the Triangle Land Conservancy and Wake County Parks and Open Spaces. Roughly 30% of all Wake County land has at least been partially processed.

Resources are a limitation of farmland preservation in Wake County and in many other counties in North Carolina. This is true even when considering that Wake has a greater number of resources than many other counties. Wake is one of the most senior counties involved in this program, but new solutions and methods continue to be developed. Securing a bond for conservation easements would be useful so that they can continually afford to close conservation easements. Having more staff with individualized roles would also be helpful. Roll back taxes fund the internal efforts of the program. In the past year, 23,000 farmland acres changed to other uses (residential, industrial, commercial). When land enrolled in Present-Use-Value changes from agricultural to another status, the rollback taxes come from the land's sale. County commissioners award rollback taxes to their program. All land coming out of protection is taxed this way, and the money is pooled.

Despite the robustness of Wake County's program, land is frequently lost to development, especially to low-density residential housing and some commercial development. With greater numbers moving to Wake County, land prices continue to rise. With this in mind, landowner reactions are generally positive, with 70% of people saying that they support these programs. Even so, only 10% of these people generally end up being involved in the execution process. Older landowners are often more willing to preserve their land, as younger generations tend to have less sentimental attachment. The primary reason for preservation is maintaining family legacy.

Easements take 1.5-6 years to complete, and there are misconceptions regarding future land use under easements. The impact is not as visible early in the process. The American Farmland Trust

Preservation Report projects that Wake County's land loss as of 2040 will be around 30,000 acres, which is about 50% of their total agricultural land. Wake County's goal is to preserve a few thousand acres within the next 5-10 years. Other goals include enabling community wealth, eliminating food deserts, and allowing agriculture to be well-distributed, as well as maintaining the health of the environment. The demand has exceeded department capacity at present, with nonprofit trusts working to help meet demands. Wake seeks to prioritize farms that have community, environmental, or geographic significance, as well as those that they feel relate to overall community welfare.

Halifax County Interview Summary

Interview Date: 10/28/2024

Interviewers: Aaron Scott, Faith Mynheer (recorder)

Interviewee: Chelsea Ricks

Contact Information: ricksc@halifaxnc.com

Role: Conservation Specialist

Department: Fishing Creek Soil and Water Conservation District

Key Takeaways:

Chelsea is a conservation specialist currently also serving as the acting manager of the Soil and Water Conservation District in Halifax County. Her role includes technical and administrative work; however, her work regarding farmland preservation primarily consists of discussing all cost-share options, including easements, with new landowners and farmers, as well as providing a point of contact for setting up conservation easements. Due to staffing limitations, landowners are referred to land trusts or Ryan Manning, who is employed by NC Soil and Water and Working Lands Trust, to guide the landowner through the application process. Ryan Manning is the contact for numerous rural counties that lack the resources to guide landowners through the easement process. Soil and Water does handle enforcement and monitoring of five conservation easements in Halifax County, three of which are held by the Agricultural Development Fund Program, one of which is held by the NC Clean Water Trust Fund, and one of which is held by the county. Each of these is monitored according to the requirements in their respective agreement. All funding in Halifax County is from the ADFP, and no county funding is currently allocated.

Chelsea's background includes various field work, such as plant surveys for the U.S. Forest Service, petroleum contamination in water in Jacksonville, Florida, and pesticide work and licensing work in the NC Department of Agriculture, the latter of which did not consist of field work but did involve close contact with farmers. Chelsea recently got her drone license, and the enforcement of easements is going to now be done with drones as well as site visits. In the three years that Chelsea has been working for Halifax County SWCD, there have been no new easements established, though one is currently in the application process.

Halifax County is not considered a high priority area, as they are not at great risk of development and are generally considered a rural/agricultural county. They are currently having a large amount of solar panels coming into the county, which has upset some farmers by taking up

usable farmland. It should be noted that in my counties - farmers and landowners differ. Thus, the solar panels may benefit landowners by providing a financial incentive for use of their land; however, solar panels offer alternative benefits to agricultural production.

Halifax County has not pushed farmland preservation more due to staffing limitations. However, Chelsea still attends all meetings between new landowners and land trusts, both to be involved and learn about the process and to maintain a relationship with the landowner prior to the monitoring process. The landowner currently applying is an elderly couple that has both owned and farmed their land for many years. They were denied one application cycle for funding for the ADFP, but are changing strategies and applying again. This strategy includes changing to an appraisal from a present-use valuation to consider more of the land as a donation and to boost their ranking in this process. It is difficult for some landowners to get easements in Halifax due to it being a low priority area. There is a lot of landowner disinterest, and the greatest motivator that Chelsea sees is sentimental value or legacy and heritage motivations. Beyond the five that the county monitors, there are several other land trusts operating in Halifax County that complete their own monitoring, including Working Lands Trust, Haw River Land Trust, and Nature Conservancy, to name a few.

All of the easements held in the county are well-maintained, and no violations have been found. Chelsea says in the future it would be helpful to consider the county allocating some monitoring funds, which could be used for a lawyer if they had any issues. Chelsea also is interested in having a "Keep the Farm" workshop in Halifax in the future if possible, which presents easements as one of many options in future farm planning. These workshops have lawyers there to discuss with farmers their wills, taxes, and educate them about other property options. She feels that having various farmer support resources at these workshops would bring more interest than simply a talk about easements, and she acknowledges that easements are not the right choice or feasible for all landowners.

If Halifax County were to fill some staff vacancies, Chelsea may consider devoting more time to farmland preservation, learning about present-use-value tax rollback and other funding options. At present, this is not something the county has discussed due to their staffing limitations. Moreover, landowners can be resistant to considering easements either because they do not wish to be financially restricted in terms of selling their land or because the monitoring and building requirements can make them feel as though easements are not compatible with their future needs or privacy.

One of the recent easements closed in Halifax County was a former hog farm with two lagoons near their creek. The lagoons are closing, so this easement may be the most environmentally impactful in Halifax County, as this eliminates the risk for the hog waste going straight to the creek.

Lincoln County Interview Summary

Interview Date: 10/29/2024

Interviewers: Faith Mynheer, Brody Milotte (recorder)

Interviewee: Evan Crawley and Madison Bridges

Contact Information: evan.crawley@lincolncountync.gov,
madison.bridges@lincolncountync.gov

Role: Soil and Water District Director, Resource Specialist

Department: Soil and Water Conservation

Key Takeaways:

Evan Crawley attended Western Carolina University where he studied Natural Resource Conservation with a concentration in Soil and Water. He volunteered with Burke Soil and Water, and has worked in various counties in Soil and Water for about 13 years. Madison has a background in Animal Science.

Lincoln County's farmland preservation efforts consist of conservation easements at present, with one established conservation easement and one currently in the application process. Lincoln County also had one in the application process that was canceled. The process of establishing an easement from the beginning to end can take 5-7 years. Lincoln County does not use its own funds beyond basic fees, meaning it can be a \$10,000-\$15,000 investment by farmers in transaction costs without a guarantee of if or when they may be approved for an easement to receive financial incentives to reimburse them for some of this cost.

In Lincoln County, the initial application is due April 30 of each year, when ideally the VAD would meet shortly thereafter to discuss the application and process. Conversations between the SWCD and the landowner are had regarding the commitment and length of the application process for establishing an easement, as well as discussing the size of the land parcel and whether they have multiple parcels or any desired land divisions. EVAD and VAD are separate from easements. To be in the VAD, you must also be part of the Present Use Value Program there. These organizations and SWCD also discuss agricultural cost share options outside of easements. Lincoln County did have a lawsuit regarding an easement against the federal government and won, which pertained to a board member in the county holding an easement and being denied funding due to their position on the board. The result of the case was that the board

member was able to continue holding their easement and receiving payment despite their board member status.

Most farmland easement owners want to receive funding both from the state and federal government. To receive federal funding, an easement must first secure state funding. Lincoln County is still becoming familiar with this process due to their limited number of easements and staffing limitations. State funding is generally easier to access, with the federal funding having more requirements and barriers. The process generally depends on the surveyor approving, then the county approving, then the state approving (which can get sent back down to the surveyor if the state takes issue with a detail regarding the land or the application), and then the easement application is sent to the federal government for approval.

Lincoln County feels that, though they are in close proximity to Mecklenburg County where the city of Charlotte is located, farmland preservation is not a major priority for the county. The county only receives funds from the ADFP for easements. They do not have set goals for farmland preservation, though they do not turn away interested landowners and are happy to work with them through this process. The major challenges for Lincoln County are that they do not have sufficient staff to dedicate to the lengthy and involved process of establishing an easement, and that they do not have dedicated employees or funding for farmland preservation. Lincoln County cannot use the county attorney to help with legal matters related to farmland preservation. The financial incentives are also not always compelling to landowners, who are offered high prices by developers to purchase their land. The restrictions within farmland preservation and conservation easements can further discourage landowners from participating, as there is added paperwork and restrictions regarding what you can and cannot build on your property, and what crops you can farm.

Lincoln County feels that outside resources would be helpful if easements were to be developed more robustly. They also note that it is difficult for farmers to make a living on solely farming, and that the long timeline can detract from the potential benefits.

Cabarrus County Interview Summary

Interview Date: 10/29/2024

Interviewers: Aaron Scott, Lillian Propst (recorder)

Interviewee: Amy Cook

Contact Information: alcook@cabarruscounty.us

Role: Resource Conservation Easement Specialist

Department: Soil and Water Conservation District

Key Takeaways:

Amy Cook is a Resource Conservation Easement Specialist at the Cabarrus County Soil and Water Conservation District. She has held this position since last year. In this role, she maintains and supports easements held in Cabarrus as a means of preserving county farmland in the face of expanding development there. Cabarrus County is located just Northeast of Charlotte, and the county has experienced a significant increase in demand for land acquisition in recent years. Cabarrus County is in the top five in the state in terms of growth by county, as the increase in prices within the Charlotte metro area have pushed developers to seek land in neighboring counties.

Amy is the only staff member of Soil and Water Conservation that is dedicated to full-time farmland preservation. Her position was created just two years ago. Given the timeline for easement application and fundraising, Cabarrus roughly averages around 1 additional easement per year. Cabarrus monitors easements on an annual basis, and they receive any necessary legal support from their county lawyer. Amy's responsibilities span the entirety of this process. She is involved in the selection of property and parcels, the completion of grant applications, and addressing logistical hurdles that arise prior to finalization. This process is especially challenging given the array of stakeholders and criteria that can affect parts of the easement process independently of one another.

In their efforts to conserve farmland, Cabarrus County focuses primarily on permanent, perpetual easements as opposed to temporary restrictions, like those involved in Voluntary Agricultural Districts (VADs). This is partially due to the lack of landowner demand for temporary conservation, in addition to greater funding potential for perpetual easements existing at the state and federal level. In general, Cabarrus has had decent success in securing state and federal funding for easements, but they do not have many options for alternate sources. One promising additional source is the North Carolina Agricultural Growth Zone Grant, which Cabarrus has

applied for this cycle (the 18th cycle of funding for this particular grant). This grant is aimed at targeting larger areas susceptible to rapid urban sprawl. Amy feels that this grant aligns well with her view that larger buffers of land are more effective in preventing sprawl in counties like Cabarrus in close proximity to urban centers.

In addition to preservation efforts, Amy focuses on educational programming and engagement efforts. Landowner engagement has been essential for Cabarrus in terms of the community's perception of preservation efforts. Amy contested that, despite the low number of easements applied for, most farmers have been in support of preservation as a concept. Generally, Amy observed that older landowners were more inclined to pursue easement conservations than younger landowners who had inherited the land. Oftentimes, older landowners can view easements as the future for their land, especially if they are nearing retirement with no one to take over the property. Amy keeps a list of interested landowners that often fall under this demographic.

If the volume of easement applications in Cabarrus increases, Amy is unsure if the department will have enough resources to maintain engagement efforts. She does expect the program to grow along with her focus on easements. Support from the county has not been an issue, but the question of funding has remained a limitation for preservation efforts. There has been minimal resistance from the public; however, there has been some opposition from those concerned with housing equity. Amy maintains that farmland preservation efforts are not anti-housing, but they do believe in limiting types of development, as land generally does not revert back to agricultural production or greenspace after it is developed. This debate, alongside the logistical challenges of easements, constitute the primary challenges Amy addresses in her work.

Time and speed, Amy says, are the main barriers to easement attainment. It can be difficult to assess the progress of easements in Cabarrus, as Amy's position has only been established for 2 years, and the easement process often ranges from 1.5-6 years overall. The amount of resources it takes to support an easement for that period of time contributes to the lack of available funding for preservation work. This results in a hyper-competitive process for acquiring statewide funds. Amy says that North Carolina recently had around 100 applications for easement funds, with only 20 being administered. Cabarrus did not receive a grant last cycle, despite Amy believing they had strong candidates for conservation.

Easements generating a net positive economic impact becomes increasingly difficult with development-caused rising land costs. Amy notes that it can be hard for landowners to "say no to big numbers".

As the county's efforts continue, they expect to see more issues in terms of monitoring and stewardship of easements. The state has been working on a process to report issues that arise

with easements and other farmland preservation policies. Currently, they can be difficult to identify.

Mecklenburg County Interview Summary

Interview Date: 10/29/2024

Interviewers: Faith Mynheer - phone interview

Interviewee: Nancy Carter

Contact Information: n3157w@yahoo.com

Role: Vice-Chair of Mecklenburg Soil and Water Conservation District

Department: Soil and Water Conservation Division

Key Takeaways:

Nancy has been an elected official for 25 years. She has a background in teaching and served for 12 years on the Charlotte City Council. One of her main goals then was to start a Resource Conservation and Development Branch (RC&D) in Charlotte, which is a partner that works with SWCDs but that is not a government branch itself. Nancy now serves on the Soil and Water Conservation Division Board. Mecklenburg County is one of the only stand alone Soil and Water Conservation Districts in the state of North Carolina, though their SWCD does collaborate with Mecklenburg County in many ways. Mecklenburg's SWCD is governed by the NC Soil and Water Conservation Commission, with three board members elected and two appointed. There are 96 districts in NC, with several counties combined to form one district. Of these Soil and Water Conservation Districts, only four are not joined to the county like Mecklenburg. This means that there is separate funding from the state based on the agricultural projects that the SWCD establishes. Their SWCD receives funding from the county and the city, often from Storm Water Departments, with which the SWCD does work on stabilizing streams, fencing livestock out of streams, maintaining or paving watering spots, etc.

Mecklenburg still has about 13,000 acres of farmland, about 200 farms, and 2 major nurseries. The county is also among the top five counties in North Carolina for highest agricultural income. Among many in Mecklenburg, there is a strong desire to preserve farmland and forestry. 13 years ago, Nancy tried to move forward with establishing a Voluntary Agricultural District in Mecklenburg, which is one of the only NC counties without an established VAD. At the time, this was not viewed as a priority for the county. Nancy is also currently serving as an Alternate NC Delegate to the National Association of Conservation Districts Board, and has founded and chaired numerous boards or committees related to environmental protection. Mecklenburg County SWCD's Chair Barbara Bleiweis is responsible for the farmland preservation in this county.

Mecklenburg's current efforts related to farmland preservation include outreach to landowners in the area to discuss options and work on a potential advisory board for establishing a VAD. The county has recently acquired some land and is working with the county extension for building opportunities to teach veterans farming. One farm, Deep Roots Farm, currently offers educational opportunities surrounding farming to children and others. Mecklenburg Parks and Recreation will also be partnering with farmland preservation to consider land use, especially regarding education and food production for county and local food banks. The two projects of education and food production, as well as the VAD, are currently in progress. Other goals include building partnerships for Working Land and Forestry programs.

Mecklenburg SWCD encourages easements but currently does not hold them, though there may be potential for this in the future. There are several land conservation entities that operate in Mecklenburg County, including, for example, Catawba Land Trust. Easements do present less of a financial benefit for farmers at times due to Mecklenburg County being a highly developing area.

Nancy views partnership, community building, and education as some of Mecklenburg SWCD's most effective strategies in implementing farmland preservation and environmental programs. This group's aim is to maintain close relationships with landowners, to provide them with accurate information, and to provide information and education about conservation and green space to the public. Much of the conservation and preservation strategies there center on using farms as educational opportunities for children, as working opportunities for individuals with disabilities, and as a food source for food insecure populations in Mecklenburg County. Mecklenburg competes in Envirothon, in which students can learn about SWCDs, forestry, can compete against 12 NC counties, and advance to nationals. Other activities that help build interest include community gardens at schools and in neighborhoods and re-establishing greenhouses in schools.

Administrative changes may impact the direction of these programs in the future, as the current Mecklenburg County manager will be retiring, as will Nancy at the end of her term. Nancy has been looking at potential funding, such as with the Atlanta Land Trust. She believes that with the right education and innovative policy, rather than maintaining an increasingly dwindling population of farmers, that the number of farmers in Mecklenburg could increase - if people knew how to farm, had an interest, and barriers to enter and sustain oneself in farming were reduced. The average age of farmers is rising. Education about careers in conservation may be important alongside educating people about farming. There is a high vacancy rate in the NC Department of Agriculture, as well as staffing issues at the county level. Limitations and challenges for Mecklenburg SWCD include staffing, as well as maintaining sufficient outreach in a highly urban area.

Development is considered the biggest threat to farmland preservation in Mecklenburg County. Mecklenburg County does have a shortage of housing and especially of affordable housing. It has a goal of 50% canopy by 2050, which it currently is not on track to meet. However, new grants to plant and help landowners to manage trees, thereby promoting conservation and land management, may help. Nancy feels that there are potential opportunities in tourism for agrotourism as another way to bring financial stability to farmers. She believes increasing funding for easements would also help them be more competitive when compared to development offers. Preservation efforts might be viewed as the future for a farmer's land; however, that land may also be seen as their retirement if it could be sold.

Lastly, as Nancy is a proponent of education, she believes an opportunity for outreach is focusing more resources on college students and young professionals who may not be familiar with the issue of conservation or farmland preservation, and could be made aware of the job opportunities that exist in these fields.

Appendix B: Survey

Block 1 - General Information

Howdy! This survey is looking to collect information about current farmland preservation policy and programs of North Carolina county governments. The entire questionnaire will take around 8-15 minutes in total. Thank you in advance for filling out this questionnaire!

The purpose for this survey is to be a policy resource for North Carolina counties either developing farmland preservation programs or seeking to develop this type of program. If you have any questions, please contact faculty advisor Dr. Will Goldsmith (william.goldsmith@unc.edu) or Chatham County Farmland Preservation Coordinator Dr. Andrew Waters (Andrew.waters@chathamcountync.gov).

- County:
- Your Name:
- Job Title:
- Department:
- Email:

Block 2 - Farmland Preservation

Q1. Does your county have an existing farmland preservation program?

- Yes
- No, but hoping to implement one
- No

Q1A. If yes, how many staff members are actively involved in farmland preservation efforts?

Short Answer

Q1B. If you have dedicated staff for farmland preservation, are they full-time or part-time?

- Full-time
- Part-time
- N/A - no dedicated staff members for farmland preservation

Q2. In your county, who is responsible for farmland preservation?

- Soil & Water Conservation District
- Planning & Zoning
- Environmental Services
- Local Land Trust
- Other or multiple (please specify)

Q3. Does your county have an organization that handles the enforcement of conservation easements?

- Yes, Soil & Water Conservation District
- Yes, another county department (please specify)
- Yes, a local land trust
- Yes, another organization (please specify)
- No, we do not have conservation easements

Q3A. If your county holds easement, do they have to be perpetual?

- Yes
- No
- Sometimes (please specify)
- N/A

Q3B. On average, how long does it take to close a conservation easement after a contract is awarded?

[Slider for number of months]

Q3C. If you hold conservation easements, do you have a written policy/agreement with your county attorney for legal defense?

- Yes
- No
- N/A

Q3D. Do you have established guidelines/protocols for easement violations?

- Yes
- No
- Somewhat (please specify)

Q3E. Who is responsible for easement monitoring and legal defense of conservation easements?

- Soil & Water Conservation District
- Other department (please specify)
- Outside organization (please specify)

Q4. What do you think is the primary factor influencing landowner participation in farmland preservation programs in your county?

- Financial incentives
- Legacy and heritage
- Environmental concerns
- Tax benefits
- Other (please specify)

Q5. What do you see as the largest risk to farmland preservation efforts in your county?

- Urban development
- Landowner disinterest
- Funding limitations
- Policy barriers
- Other (please specify)

Q6. Do you provide financial assistance to landowners for transaction costs?

- Yes
- No

Q6A. If yes, how is the assistance provided?

- We pay expenses directly
- Landowners must submit paid invoices for reimbursement
- Other (please specify)

Q7. What is your county's source of funding for conservation easements? (Select all that apply)

- Agricultural Development Fund Program (ADFP)
- Article 46 Tax Revenue (a local-option quarter-cent sales tax approved by voters, often used to fund public projects)
- Roll-back taxes
- Bonds
- Other (please specify)

Q7A. What is your county's main source of funding?

Q8. If your county uses PUV rollback taxes for farmland preservation, how is that funding allocated?

- Perpetual/ongoing
- Designated only for specific projects
- No, we do not use PUV rollback taxes for farmland preservation
- Other (please explain)

Q9. Has your county designated agricultural priority areas for farmland preservation?

- Yes
- No
- Somewhat (please specify)

Block 3 - Program Structure and Challenges

Q10. Do you require a legal defense or stewardship contribution to hold an easement?

- Yes
- No

Q10A. If you require a legal defense or stewardship contribution to hold an easement, where are those funds held (e.g., escrow, trust, other)?

Q11. How do you prioritize projects for funding applications?

Q12. Who is responsible for negotiating conservation easements in your farmland preservation program?

Q13. How is the county's funding for farmland preservation keeping up with development pressure and rising real estate prices?

Q14. What do you think are the biggest challenges or barriers to improving farmland preservation in your county?

Q15. What information or training topics would be helpful for your farmland preservation programming initiatives?

Block 4 - Potential Follow Up

Would you be willing to do a follow-up interview with us?

- Yes
- No

Appendix C: Interview Protocols

Understanding Farmland Preservation Programs in North Carolina Counties

Protocol:

To help facilitate our notetaking, we would like to record this interview in order to produce an accurate transcript and summary of the conversation. This also helps us pay closer attention during our conversation. Only the researchers on this project will have access to the transcript, and it will be properly discarded after the finalization of the project. May we record this conversation? [WAIT FOR VERBAL CONSENT]

Thank you for agreeing to participate. We plan for this conversation to last 30 - 45 minutes, but please just let us know if you have a hard stop at a particular time.

Introduction:

Thank you for taking the time to speak with us today. We are a small team of UNC Chapel Hill Public Policy students working with Andrew Waters of the Chatham County Soil and Water Conservation District on a project to understand farmland preservation programs across the state. We want to catalog and improve upon the policies that are currently in place regarding farmland preservation. We want to identify best practices from counties with established programs to help other counties develop and implement their own initiatives.

You were asked to complete the survey as we believe your role or department is closely related to farmland preservation. Thank you for agreeing to this follow-up interview.

A. Interviewee Background

To begin this interview, I would like to ask some brief questions to get a better understanding of you and your background.

- Can you tell me about your current role and responsibilities in your county's farmland preservation program (or equivalent)?
- What is your background in this field?
 - [Probe] - What is your educational background, and how has it prepared you for your work in farmland preservation?
- How has your role evolved over time?
 - [Probe] Are there any specific experiences, either personal or professional, that have shaped your approach to farmland preservation?

Thank you. Next, I would like to discuss some questions surrounding your county's goals and progress regarding farmland preservation.

B. Goals and Progress

- What are your county's goals for farmland preservation?
 - [Probing Question]: Can you walk me through how your county has developed these goals?
- Can you talk about your work toward achieving these goals?
 - [Probing question]: How do you assess whether you're meeting these goals? What milestones have been most critical in driving progress?
 - Can you tell me more about <<that>>?
 - What have been some significant moments (or turning points) in your county's work toward meeting these goals?
- Can you describe some of the primary farmland preservation tasks that your organization is responsible for?
- Do you have an estimate of what percentage of farmland in your county has been protected through preservation programs?
 - How does this compare to your county's total agricultural land, if you know?

Thank you. Now I would like to ask specific questions about the policies and strategies being used regarding farmland preservation in your county.

C. Policies and Strategies

- What strategies have been most effective in protecting farmland in your county?
 - Can you talk about why they've been especially effective?
 - [Probing question]: How do these strategies compare to approaches used in neighboring counties or states?
- Are there any strategies that you believe could better support farmland preservation in your area?
 - Any specific policies?
- What advice or lessons would you offer to other counties looking to establish farmland preservation programs?

Thank you. I would like to ask some specific questions regarding overall department capacity and resources relevant to farmland preservation in your county.

D. Department Capacity and Resources

- How well-equipped do you feel your department is to handle farmland preservation tasks in your county?
- What challenges, if any, have you encountered in securing funding or resources for farmland preservation?
 - [Probing question]: Can you discuss any recent efforts to secure alternative funding sources, such as grants or partnerships, and their outcomes?

Thank you. Now I would like to ask specific questions regarding threats to farmland preservation in your county.

E. Threats to Farmland Preservation

- What are the most significant issues affecting the loss of agricultural land in your county?
 - [Probing question]: Could you share any specific examples of how these challenges have impacted recent farmland preservation efforts?
- How have landowners reacted to the preservation efforts?
- Have there been any resistance or challenges in working with landowners regarding participation in the program? If so, can you talk about how you have addressed them?

Thank you. Lastly, I want to wrap-up with some questions related to farmland preservation programs and its impacts along with some final thoughts.

F. Program Impact and Final Thoughts

- What impacts have you observed as a result of your county's farmland preservation efforts?
 - Economic?
 - Environmental?
- How has farmland preservation contributed to the long-term sustainability of agriculture in your county? (for those in urban areas - personalize for each draft)
- What other things do you believe are relevant to farmland program initiatives that we didn't cover?

Thank you so much for your time. This conversation has been very helpful to our understanding of farmland preservation. Please be in touch if anything else comes to mind that would help us understand best practices for farmland preservation in North Carolina.

If more time is needed:

Would you be willing to do a short follow-up interview with us to go a little more in depth to these responses? If so, when would you be available to schedule this?

Appendix D: Literature Review

Introduction

Farmland preservation is a strategy that aims to prevent the loss of agricultural land to development or other non-agricultural uses. By securing farmland as permanent land uses, it protects the land from being converted and ensures the long-term viability of the area. This main objective is to create clear boundaries and to separate agricultural zones from designated growth areas for development. This literature review seeks to examine the existing knowledge of farmland preservation focusing on the historical context, effective funding mechanisms, and best management practices. The goal of this paper is to use these findings and insights to shape our recommendations for strengthening farmland preservation efforts in Chatham County.

Historical Context Of Farmland Preservation

The history of conservation in the United States highlights policies and governmental responsibility driven by public responses to environmental degradation. In the early 20th century, the New Deal era ushered in significant policy changes, such as the Soil Conservation Act of 1935 and the establishment of programs like the Civilian Conservation Corps (CCC). These initiatives laid the foundation for border environmental conservation frameworks, which later included farmland preservation as a key priority (Maher, 2002; Soil Conservation and Domestic Allotment Act, n.d.). As development increased and urbanization spread, the loss of farmland became a major concern, which sparked the need for more concrete preservation efforts (A Brief History of NRCS, n.d.).

As the expansion of cities and towns came at the cost of rapid farmland loss, farmland preservation efforts became more prevalent. The central aim was to protect land from being developed and maintain agricultural activity in the face of increasing urban sprawl and residential development. The preservation of farmland was not only seen as a way to protect productive soil and land but also as a means of financially supporting the farming industry, sustaining rural communities, and maintaining environmental health (Peterson, 1983). This context advanced the development of policies and initiatives designed to safeguard farmland, especially through key tools like conservation easements.

Conservation easements have become a prominent mechanism in farmland preservation across the United States. Conservation easements are legal agreements that allow landowners to enter into agreements with land trusts or government agencies where they sell or donate the land while still being able to retain ownership of the land. By entering into these agreements, landowners are

able to protect their land, usually for a specific use such as farmland, while keeping it in private ownership and generating tax revenue for local and state governments.

As these efforts and ideas laid the groundwork for farmland preservation initiatives, conservation easements emerged as a fundamental instrument for the preservation of farmlands in the United States. Conservation easements are an important preservation tool that allow landowners to enter into agreements with land trusts or government agencies where they sell or donate the land while still being able to retain ownership of the land. Landowners are able to protect their land, usually for a specific use such as farmland, while keeping it in private ownership and generating tax revenue for local and state governments. These easements serve multiple purposes from protecting habitats to preserving agricultural production to safeguarding cultural and historical landscapes (Farmer et al., 2002). As a result, conservation easements are one of the main key tools in ensuring the preservation of farmland for future generations.

Funding Mechanisms for Farmland Preservation

Federal Funding Programs

The Agricultural Conservation Easement Program (ACEP), administered by the Natural Resources Conservation Service (NRCS), promotes the preservation of agricultural lands by investing in conservation easements. The application matches federal funds with investments from local partners, inclusive of land trusts and state programs, to buy and establish easements. Local partners are then accountable for tracking the easements to ensure compliance with easement regulations, specifically non-development restrictions (U.S. Department of Agriculture, Natural Resources Conservation Service, 2024).

The Inflation Reduction Act allotted \$1.4 billion to ACEP, allowing accelerated partnerships and investments in farmland conservation. Additionally, federal tax deductions are available for donated easements. These deductions permit landowners to offset as much as 50% in their earnings, with any ultimate gain carried over for up to fifteen years.

North Carolina Conservation Tax Credit: History and Impact

North Carolina has a history of incentivizing farmland maintenance through tax credits. The authentic NC Conservation Tax Credit, enacted in 1983, provided an income tax credit equal to 25% of the donated assets' fair market value below conservation easements (Session Law 1983-793). This tax credit was repealed in 2013 through the Tax Simplification and Reduction Act, eliminating a key incentive for landowners.

In response, the Conservation Trust of North Carolina (CTNC) released the *Money in the Ground Initiative*, which funded farmers' legal and survey expenses for setting up easements. Over five months, the initiative provided 63 grants, conserving 7,400 of farmland and leveraging \$28 million in cost (Conservation Trust for North Carolina, 2024).

On July 7, 2024, the North Carolina Farm Act of 2024 reinstated the tax credit, restoring its original phrases. Under this regulation, landowners receive a credit score equal to 25% of the donated land's market value, incentivizing long-term participation in farmland conservation packages (Session Law 2024-32).

North Carolina Present-Use Value Tax Incentive

North Carolina's Present-Use Value (PUV) Program gives tax alleviation to landowners who use their land for agriculture, forestry, or wildlife conservation. PUV reassesses land value based on its contemporary use in preference to marketplace potential, decreasing the landowner's tax liability (North Carolina Department of Revenue, 2023).

However, deferred taxes—representing the distinction between standard and decreased tax quantities—should be repaid if a landowner leaves this system voluntarily. This repayment covers three years of deferred taxes and might deter some landowners from enrolling. Still, the program serves as a critical device in preserving agricultural lands.

Local Government and Land Trust Roles

Local governments and land trusts are important companions in securing and keeping conservation easements. They observe for federal funding through packages like ACEP and offer matching finances to set up easements. County Soil and Water Conservation Districts (SWCDs) receive nearby investment to help farmland protection applications. These districts allocate sources for easement tracking, compliance, and documentation. Land Trusts collaborate with farmers to become aware of suitable lands for easements and guide them through the regulations necessary for federal and state investment. Through these partnerships, local entities enhance the efficiency and reach of federal conservation projects, ensuring that farmland preservation stays a priority in many tiers of governance.

Soil and Water Conservation Districts (SWCDs)

Established beneath NC General Statutes §139-5, Soil and Water Conservation Districts (SWCDs) perform in all one hundred North Carolina counties. These districts put in force Farmland Preservation Programs, legal by way of NC General Statutes §106-736, to support easement monitoring and enforcement (Session Law 1985-1025). SWCD's partners with landowners to establish conservation easements, apply for federal investment and often provide monetary support for easements inspections and monitoring.

North Carolina Agricultural Development and Farmland Preservation Trust Fund (NC ADFP)

The North Carolina Agricultural Development and Farmland Preservation Trust Fund (NC ADFP) presents offers to assist the conservation of running farmland, forestland, and agricultural

organizations. The ADFP works collaboratively with local governments, land trusts, and farmers to fund agricultural easements, enhance conservation plans, and help associated tasks.

Buffer Zones

Outside of North Carolina, buffer zones have been instituted at the county level to address farmland preservation aims. This involves targeting parcels of land for conservation based on the land's ability to have an impact on larger development trends. One successful case study encountered in our research is the Oregon Case Study of Urban Growth. Limits on development would be established for development outside of designated barriers to protect areas of farmland. However, mixed-use zoning is generally required for this policy to avoid drastic increases in housing costs due to limited availability of land for development. In Portland, the largest city in Oregon, housing prices rose by 69.41% between 1991 and 1996 (Xu & Zhu, 2018). The Urban Growth Boundary was established in Oregon in 1980 and while density of housing did increase, so did housing prices. This solution also may exacerbate effects of spillover if collaboration among counties is not seen.

Best Management Practices

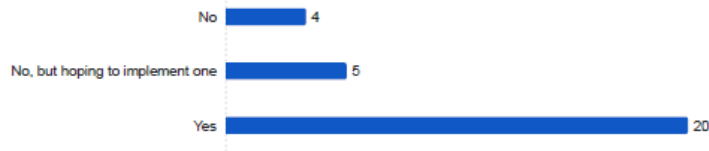
Conservation easements are voluntary processes that involve two key aspects. Firstly, it is crucial that the farmland, that has either been sold or donated, is protected from development and preserved, which is the initial step upon entering a conservation assessment. The second key aspect is that this land is properly managed to ensure that the land is being conserved and monitored accordingly (Daniels, 2019). Because conservation easements are utilized in a broad manner, it is critical to establish these two main phases of the process as well as incorporate best management practices to ensure that farmland preservation is being conducted in a productive fashion.

As conservation easements increase in their use as a powerful tool to preserve farmland, it is important to hone in on the scope of the issues they aim to address. Widely used indicators of success include the number of acres preserved and their effects on land markets, local agricultural economies, urban development, and long-term land conservation and protection, however, these indicators do not align with the goals associated with conservation easements for farmland protection (American Farmland Trust and Agricultural Issues Center, 2006). Through research, it has been revealed that these incorporated goals are influenced by public preference and perception. While the collaboration of public opinion and policy is pertinent, these goals seem to not advance the impact of what farmland preservation can actually accomplish (Duke & Aull-Hyde, 2002). Adopting sticker criteria for selecting farmland to preserve would enable agencies to become more credible in their efforts and in turn increase public perception (Stoms et al., 2009).

Appendix E: Survey Report

Below are the results from our survey report, including detailed tables presenting the metrics for all multiple-choice responses and a concise summary of the feedback provided in the short-answer questions.

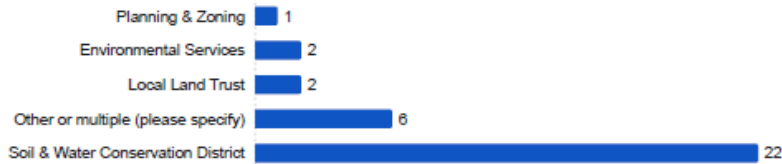
Does your county have an existing farmland preservation program?



If you have dedicated staff for farmland preservation, are they full-time or part-time?

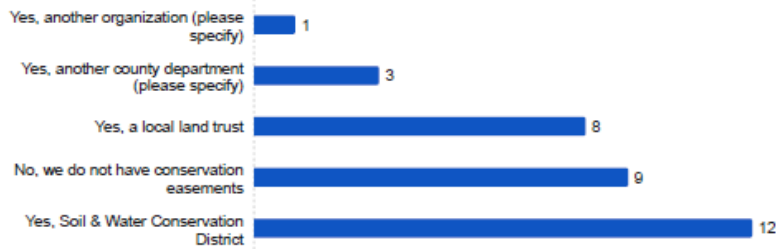


In your county, who is responsible for farmland preservation?



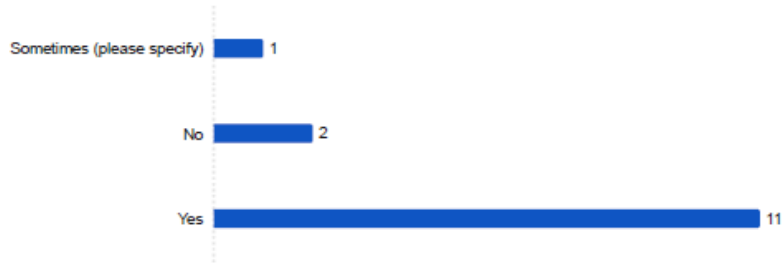
Respondents who selected 'Other' specified entities such as SWCDs combined with local trusts, SWCDs partnered with Cooperative Extension, or noted that no specific organization was designated.

Does your county have an organization that handles the enforcement of conservation easements?



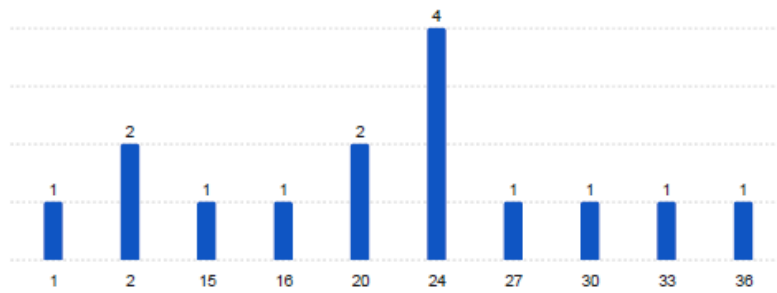
Respondents who selected 'another organization' or 'another county department' specified entities such as Energy and Environmental Services.

If your county holds easement, do they have to be perpetual?



One respondent specified that their county is working on making their easements perpetual

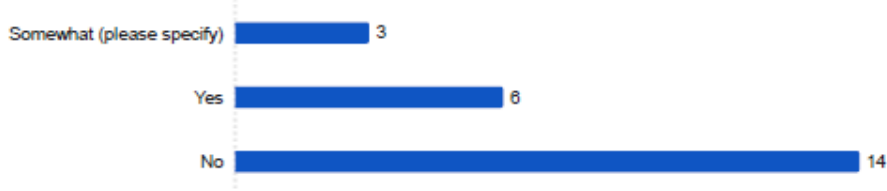
Average number of months to close a conservation easement



If you hold conservation easements, do you have a written policy/agreement with your county attorney for legal defense?



Do you have established guidelines/protocols for easement violations?



Those who selected 'somewhat' mentioned that, according to the conservation easement deed, protocols are in place, or that a draft of established guidelines for addressing violations based on the Land Trust Alliance's recommendations has recently been initiated, though it has not yet been completed or adopted.

Who is responsible for easement monitoring and legal defense of conservation easements?



Respondents who mentioned outside organizations identified Energy and Environmental Services and their county.

What do you think is the primary factor influencing landowner participation in farmland preservation programs in your county?



Respondents who selected 'Other' cited various factors, including input from children and family, conservation considerations, uncertainty, land rights, and general knowledge.

What do you see as the largest risk to farmland preservation efforts in your county?



Respondents who selected 'Other' highlighted concerns related to future owners and land value, the low incentives for rural farmers, state-wide pooling, and a combination of all these factors.

Do you provide financial assistance to landowners for transaction costs?

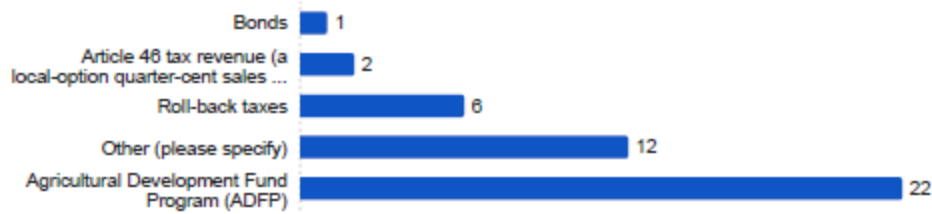


If yes, how is the assistance provided?



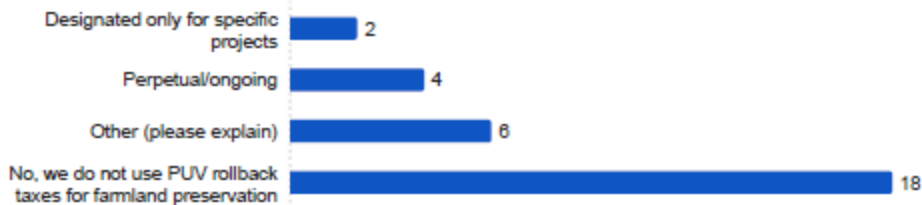
Respondents who selected 'Other' mentioned factors such as undetermined elements, the presence of specific guidelines for different funds, and a combination of both.

What is your county's source of funding for conservation easements?



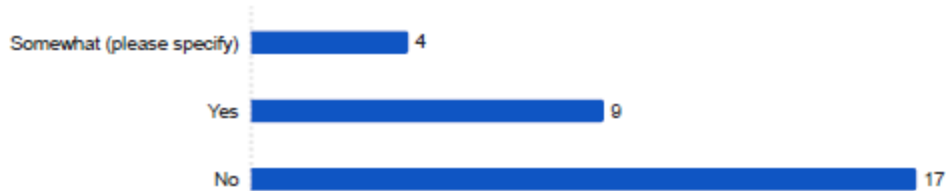
Respondents who selected 'Other' provided a range of responses, including none, capital funds, land trusts, NRCS-ALE grants, undetermined factors, private entities, USDA-ALE, county funds, N/A, and annual budget allocations.

If your county uses PUV rollback taxes for farmland preservation, how is that funding allocated?



Respondents who selected 'Other' indicated that they either do not have a program in place or that the process remains undetermined.

Has your county designated agricultural priority areas for farmland preservation?



Respondents who selected 'somewhat' noted that the process is in progress, remains undetermined, or that our Soil and Water Conservation District (SWCD) group has established a priority area.

Do you require a legal defense or stewardship contribution to hold an easement?



Summaries for Short Answer Questions

1. If you require a legal defense or stewardship contribution to hold an easement, where are those funds held?

- Responses varied, with some counties using land trusts or independent accounts to hold stewardship funds, while others lack designated funds and require landowners to manage their own defense.

2. How do you prioritize projects for funding applications?

- Most counties employ ranking systems, using either state-recommended criteria or custom tools. Some prioritize based on factors like landowner interest, environmental significance, or readiness for funding, while a few counties do not have established prioritization protocols.

3. Who is responsible for negotiating conservation easements in your farmland preservation program?

- Soil and Water Conservation Districts and local land trusts are commonly responsible for easement negotiations, though some counties rely on external organizations or have limited involvement in direct negotiations.

4. How is the county's funding for farmland preservation keeping up with development pressure and rising real estate prices?

- Many counties report that funding is inadequate to match rising real estate values and development pressures. Some have received limited recent funding, but most indicate that preservation funding has not kept pace with demand.

5. What do you think are the biggest challenges or barriers to improving farmland preservation in your county?

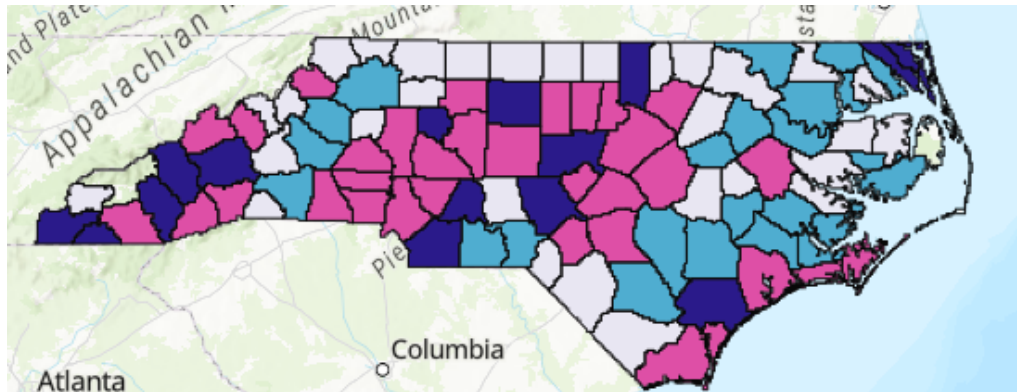
- Key barriers include funding limitations, lack of local buy-in, rising real estate prices, and challenges in engaging younger generations in farming. Some counties also highlight difficulties in matching conservation easement funds to land values.

6. What information or training topics would be helpful for your farmland preservation programming initiatives?

- Requested training topics include easement legal requirements, grant writing, farm transition planning, and outreach strategies for landowner engagement. There is also interest in training county officials on the importance of farmland preservation.

Appendix F: Map

[Interactive Bivariate Map](#) (use the hyperlink to access the map)

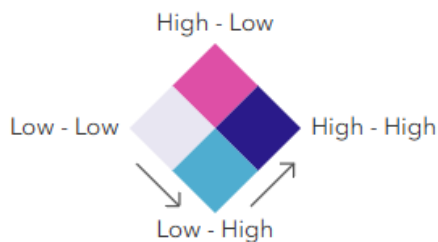


This interactive bivariate map was designed for county officials using USDA Census Bureau data from 2012 and 2022. It highlights percentage changes across all counties in North Carolina for key metrics, including employed population, farming population, farmland acreage, median household income, per capita income, total population, and population density. The map offers a visual way to analyze trends over time and compare these changes across counties, providing valuable insights for decision-making.

Relationship

↗ Population % Change (2012-2022)

↘ Farmland % Change (2012-2022)



This image shows how to interpret one of the bivariate relationships on the map: Population Percentage Change (2012–2022) vs. Farmland Percentage Change (2012–2022).

- Dark blue represents counties with both high population growth and high farmland loss (High-High).
- Pink indicates counties with high population growth but low farmland loss (High-Low).
- Light blue shows counties with low population growth but high farmland loss (Low-High).

- Light gray signifies counties with low population growth and low farmland loss (Low-Low).

The arrows suggest an inverse relationship between the two variables. This tool allows users to quickly identify patterns, such as areas experiencing significant farmland loss alongside population growth, which may indicate urban expansion or development pressures.

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