Public Preferences and Willingness to Pay for Farmland Preservation in Four Connecticut Communities:

Case Studies of Brooklyn, Pomfret, Thompson and Woodstock

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Executive Summary

Understanding the economic benefits and costs of community land use decisions is crucial to ensure that decisions improve residents' well-being, and that the public supports associated policies. This includes policies that preserve farm, forest, and open space. Connecticut residents value farmland and the preservation of rural settings. While historical bond referendum results demonstrate significant support for farmland preservation programs, there has been limited information regarding ways in which the public prioritizes and values land preservation. Moreover, much of that which the public values in agricultural land—for example, rural community character, agrarian scenery, insulation from disamenities associated with developed land, and wildlife habitat—is not bought and sold in markets. As a result, market transactions do not reflect the full value of farmland to the public. Without insight to residents' non-market values (or willingness to pay) for particular types of farmland and its uses, state agencies and non-profit land preservation groups may not allocate preservation funds in a way that best supports public welfare.

This report details results of a survey addressing residents' willingness to pay for farmland preservation within four Connecticut towns: Brooklyn, Thompson, Pomfret, and Woodstock. The Land Preservation Survey presented respondents with a chance to vote, "yes or no" over many different community-level land preservation options with varying tax costs to their households. Estimates obtained from the analysis of these responses provide information regarding additional taxes and fees that residents would be willing to pay in order to obtain specific types of farm and forest preservation. Results also indicate the priorities that residents place on different types of preservation.

Results show that residents within the four communities support the preservation of farmland and open space, as reflected by an often significant household willingness to pay for farmland preservation. **On average, willingness to pay per household, per acre, per year for farmland preservation ranges from $0.22 in Thompson to $0.49 in Pomfret. Aggregating these values over town households and time periods results in town-wide capitalized per acre WTP estimates that range from $5,917 in Thompson to $8,699 in Woodstock. Analogous values in Brooklyn and Pomfret are $7957 and $7245 per acre, respectively.** These latter estimates may be directly compared to the market cost of preservation, to assess whether preservation benefits exceed the costs, or whether residents would be willing to pay sufficient amounts to offset the cost of particular preservation activities.

The level to which residents within each town are willing to pay for (or support) preservation depends on the specific attributes of preservation programs. As an

example, residents tend to value the preservation of livestock and/or dairy farms somewhat more than the preservation of other farm types. Residents prefer preservation programs that target lands at high development risk, compared to otherwise identical programs that target lands at lower risk of development. Public access also has a significant impact on willingness to pay for preservation, with residents of all four towns willing to pay larger amounts to preserve land with some degree of access.

Despite the many similarities in public preferences that are shared across the four towns, there are also notable differences. For example, while residents of all towns indicate substantial willingness to pay for farmland preservation on average, the types of preservation that are most highly valued sometimes differ across towns. The *variability* of willingness to pay also differs across towns. Some of the towns express similar values for many types of preservation, while others express very large differences in willingness to pay depending on the specific attributes of a preservation program.

Overall, study findings suggest that a wide array of preservation attributes influence the degree of public support for farmland preservation and associated willingness to pay. Although land preservation initiatives generally receive strong public support, this study reveals that public support may vary considerably depending on the specific ways in which preservation is conducted and the types of lands that are preserved. Agencies or organizations that ignore such preferences when conducting preservation may promote policies that—contrary to the best intentions—face a lack of public support. In contrast, appropriate use of such findings can assist towns in prioritizing preservation activities, and allocating public funds, in a way that will maximize public support and the well-being of local residents.

Introduction

Willingness to Pay and the Public Value of Farmland Preservation

A recent survey shows that ninety-one percent of Connecticut residents feel that preserving rural areas in Connecticut is important, while ninety percent agree that it is important to maintain farmland in the state for future generations (CSRA Analysis, 2000). In response to such opinions, the State of Connecticut has established a goal to preserve 21 percent of the state's undeveloped lands by 2023. Farmland preservation is valued by residents of Connecticut. But what is the value of farmland preservation to the public, and how should this value be integrated into farmland preservation decisions? What type of preservation provides the greatest public value? How should preservation policies be designed to garner the greatest public support?

Although statewide funding for land preservation has increased substantially in 2007 – with PA 07-162 allocating an additional $5 million of approved bonds toward farmland and open space preservation each year – many local municipalities still suffer from lack of direction for preservation activities. Residents continue to vote "yes" for preservation, yet committees charged with pursuing parcels for these programs often have little guidance regarding the types of parcels residents value most, or which preservation activities would be in the best interests of the voting public.

While historical referendum results demonstrate significant support for preservation programs, these votes provide limited information regarding ways in which the public prioritizes and values the preservation of agricultural lands. Much of what the public values in agricultural land—for example, rural community character, agrarian scenery, insulation from disamenities associated with developed land, and wildlife habitat—is not bought and sold in markets. The value of these services, therefore, is not reflected in the monetary returns to farming or in real estate market transactions. If such non-market values are significant, market activities will tend to generate too much development (i.e., loss of farmland) and too little farmland preservation, because they will not account for the non-market values provided by local farms. Without insight to residents' non-market values (or *willingness to pay*) for particular types of farmland and its uses, state agencies and non-profit land preservation groups may not allocate preservation funds—or implement preservation activities—in a way that best supports public welfare or encourages continuing public support.

What is Willingness to Pay and Why is it Important?

Although the non-market values of farms and farmland are not reflected in market transactions, they can be measured using carefully designed economic methods. These methods measure values as the willingness to pay (or WTP) of residents for farmland preservation in their community. WTP reflects the maximum amount of money that residents would be willing to forgo in exchange for a particular good or service—in this case, a particular farmland preservation outcome. It is a well-defined economic measure of value based on the idea that individuals should not be voluntarily willing to pay more for a good or service than it is actually worth to them.[1] Hence, public WTP for specific types of farmland preservation indicates the value generated by that preservation, or the maximum amount that the public would be willing to pay to preserve specific types of local farmland. Conversely, it represents the social value that is foregone when farmland is lost to development.

Willingness to pay may also be thought of in parallel terms to referenda on farmland preservation bonds. When residents vote on a bond issue, they are indicating a personal willingness to pay (in terms of increased taxes to fund the bond) in exchange for the specified farmland preservation activity. In 2006, Connecticut voters revealed their support for preservation by passing 86 percent of local bond initiatives for farm, forest, and open space preservation. While these votes reflect residents' willingness to pay for land preservation within the state, referendums such as these provide little detail about what types of preservation the people in Connecticut value. That is, referenda indicate that residents do, in fact, value farmland preservation. What they do not indicate is the magnitude of these values; nor can the observed votes reveal the type of preservation that is associated with larger or smaller values. Economic methods, however, can provide this information through the use of carefully designed survey instruments that mimic such referendum votes. That is, survey responses reveal the maximum bond payments that the public would be willing to pay in exchange for specific types of farmland preservation in their community or state.

The Land Preservation Survey Project

This report details the results of a survey addressing residents' WTP for farmland preservation within four Connecticut towns: Brooklyn, Thompson, Pomfret, and Woodstock. The project was funded by an Agricultural Viability Grant from the State of Connecticut, and commissioned by the Eastern Connecticut Resource Conservation and Development Area, Inc. Research funds were directed through the Town of Thompson, which was the official recipient of the Agricultural Viability Grant. The

[1] For example, an individual who states he or she is willing to pay as much as $X for a program to preserve specific farmland resources is viewed by practitioners as indicating that her value for the farmland services at issue is in fact $X.

project was conducted by researchers from the Universities of Connecticut and Delaware from September 2006 to September 2007. The project builds upon prior surveys and research efforts supported by the National Research Initiative of the Cooperative State Research, Education and Extension Service, USDA, Grant # 2003-35400-1387.

Randomly sampled residents of each town were asked to respond to survey questions designed to elicit household WTP for different types of farmland preservation in their towns. These voting-type questions were specifically designed to identify the potential impact of preservation program characteristics (e.g., how many acres are preserved, what type of land is preserved, whether public access is provided) on individual decisions and WTP values. This method of survey research—based on voting-type choices of individuals—is called the *choice experiment*. Using data from the present choice experiments, researchers are able to quantify the benefits that community residents receive from preservation of particular types of farm, forest and open space. The analysis can also identify residents' relative preferences for different types of preservation, and which types of preservation are likely to garner the greatest possible public support in each community.

Using the four towns as a medium for the analysis, survey responses reveal WTP per household, per acre, per year for the type of land specified in the survey questions. By adding up, or aggregating, the responses obtained from each town's households, the total annual value per acre over all town residents may be estimated. From these results, annual values can be capitalized – or reported as a total present value – over time by discounting future cash flows from these additional values at an appropriate rate. The result is a total value per acre of farmland preserved. This number can be compared to the cost of preservation, to assess whether the benefits of (or WTP for) land preservation outweigh the costs.

This report provides both a summary of these capitalized values to town residents over time and investigates factors that influence choice decisions. A review of policy implications is also provided. As the results of this study reveal the value of agricultural land preservation to the residents of each of the four towns, this study may be used to better inform future policy decisions regarding farmland preservation.

Survey Development and Implementation

Survey Development and Testing

As noted above, the choice experiment surveys analyzed for this report were developed based on previous design efforts funded by the U.S. Department of Agriculture and conducted by researchers from the University of Connecticut and the University of Delaware. Within Connecticut, these prior efforts funded survey development, implementation and data analysis for the towns of Mansfield and Preston (CT) as well as a broader survey for the State of Connecticut as a whole. Development efforts for these prior surveys informed the format, language and methods for the four surveys reported here (Brooklyn, Pomfret, Thompson and Woodstock), allowing implementation of these latter surveys within the budget provided by the State of Connecticut Agricultural Viability Grant program.

Survey development efforts for the entire set of surveys included over 18 months of background research, interviews with land use experts and stakeholders, and 14 focus groups. One of the initial purposes of focus groups was to identify respondents' perceptions of the land preservation policy process and associated outcomes. Extensive pretests were conducted in focus groups and interviews to ensure that the survey language and format could be easily understood by respondents, as it is vital that respondents share interpretations of survey terminology and scenarios. Based on focus group and pretest results, survey questions were designed to capture relevant and land use and policy attributes viewed as realistic, salient, and clear by the general public. Pretesting also helps ensure that respondents will answer survey questions the same way that they would respond to a parallel, binding public vote. Focus groups led to a self-administered mail survey, following the choice experiment framework detailed above.

Survey Distribution and Data Collection

Researchers mailed the self-administered choice experiment survey to 1600 randomly-selected residents In Brooklyn, Pomfret, Thompson, and Woodstock during early 2007. The Land Preservation Survey presented respondents with a chance to vote yes or no over many different community-level land preservation options with varying tax costs to their households. Statistical analysis of thousands of votes over hundreds of different preservation choices enabled researchers to derive estimates of the average willingness to pay to preserve different types of farm and forest land, and the relative

priorities placed on different preservation options. Willingness to pay estimates reflect additional taxes and fees that residents would be willing to pay in order to obtain specific types of farm and forest preservation in their town. Of the 1600 surveys that were deliverable, 45.6% of the surveys were returned, generating a sample of 730 responses. Responses represent a broad cross-section of residents for each town.

Survey Design and Structure

The survey included three distinct sections to help survey respondents communicate values and opinions regarding land preservation. Section one of the survey booklet provided a background summary of current land use in each town. Respondents were given details regarding the rate of change of developed lands over the last twenty years as well as how much land within their town is currently active in farming. This initial section also included a reference to the Connecticut state goal of preserving 21 percent of its undeveloped lands.

A secondary purpose of this introductory section was to ease survey respondents into self-assessing their priorities and values for different preservation options. The survey accomplished this by asking simple "warm-up" questions that encouraged respondents to consider the various pros and cons of land preservation efforts, as well as the aspects of land preservation that were most important to them. Respondents were also provided with "user-friendly" information on the basic methods of preservation available in Connecticut, and the ways in which preservation activities could differ (e.g., type of land preserved, provision of public access, etc.). This information was pretested extensively to ensure that the general population would understand the survey as intended. Table 3.1 summarizes the various preservation methods included in various survey scenarios considered by respondents.

Table 3.1. Summary of Preservation Methods Included in the Survey

Preservation Methods	
Outright Purchase (Town or State)	Purchase and preservation of farm and forest lands by governments. Land is purchased in voluntary transactions from interest landowners at a negotiated price, and is preserved as farm or forest. Preservation is guaranteed forever.
Preservation Contracts (Town or State)	Interested landowners are paid a fee in return for placing a legal contract on their land that prevents all future development. Ownership and use of the land does not change, but development is contractually and permanently prohibited.

The second section of the survey booklet showed respondents a number of distinct hypothetical town referendum voting choices, in which respondents were asked to compare two preservation options and then vote on which option, or neither, that they would prefer. Respondents were reminded that these choices could influence actual

policy decisions, to ensure that choices reflected the types of policies that respondents would truly wish to see enacted. Each choice question provided survey respondents with details for each preservation option. Respondents were told the type of land being considered for preservation, the number of acres that would be preserved, what method of preservation would be used, as well as details on accessibility and probability that these parcels would be developed in the next ten years.

The table below summarizes all the possible characteristics that were provided to survey respondents. One attribute from each category was randomly included for each survey choice question, providing a total of 48 different possible preservation types that might be included in a referendum question. In order to answer choice questions, respondents had to weigh the relative importance of each preservation attribute, while also considering the overall cost to their household.

Table 3.2. Summary of Attributes

Attribute	Available Options	Description
Acres Preserved	20, 60, 100, 200	Acres ranged from a typical "small farm" option to a "large farm"
Land Type	Food/Field Crop, Forestry/Orchard/Tree Farm, Dairy/Livestock Farm	Potential uses for farmland in Connecticut
Method of Preservation	State preservation contract, Town preservation contracts, State outright purchase, Town outright purchase	Four possible methods to preserve land in the state, ranging from state purchase to town-sponsored contracts
Accessibility	Access , No access	Preserved land is open for passive recreation (hiking, bird watching, etc.), or closed to public access
Risk of Development	Development likely, Development not	If not preserved, is the land likely to be developed for uses other than agriculture/open space in the next 10 years
Household Cost	$5, $15, $30, $60, $120, $200	Increase in mandatory State or Town taxes and fees paid by the household and necessary to implement preservation.

Respondents were given four choice questions in each survey; each question provided two preservation options with different attribute levels. Questions were considered separately as individual votes. The variation among the choice attributes provided opportunity for respondents to express their votes for a number of different, realistic scenarios.[2] Variation in attributes across scenarios was determined by a statistical

[2] In addition to the number of acres preserved and program cost, this survey considered a total of 48 possible land preservation options upon which respondents voted. We get 48 options of

design to ensure unbiased and efficient model estimation. The example below shows a sample choice question from the land preservation survey.

Figure 3.1. Sample Choice Experiment Question

3. Assume that the following two preservation options were proposed for your community. How would you vote? Choose one.

	Option A	Option B
Type of Land Preserved	Active Farmland (Food or field crop)	Active Farmland (tree farm, forestry, or orchard)
Acres Preserved	20 Acres (single lot)	100 Acres (single lot)
Method	Preservation Contracts by State of Connecticut	Outright Purchase by Town of Brooklyn
Public Access	No Access Allowed	Access for Passive Recreation (Hiking, bird watching, etc.)
What Happens if Not Preserved	Development NOT likely within 10 years if not preserved	Development likely in less than 10 years if no preserved
Cost to Your Household	$60 per year (Increase In State or Town Taxes & Fees)	$120 per year (Increase in State or Town Taxes & Fees)

Please Check One:

- □ I would vote for **Option A**, and pay $120 per year
- □ I would vote for **Option B**, and pay $140 per year
- □ I support these programs in general, but my
- □ I would not vote for either program

The final section of the survey solicited demographic information and other details that allow researchers to characterize respondents and better understand the attributes of those who responded to the survey. This section also provides information that allows researchers to compare the demographics of survey respondents to those of the population as a whole, to assess the extent to which respondents are representative of the broader population.

Survey responses were delivered in self-addressed postage-paid envelopes and data results were entered individually. After data entry, responses were verified for completeness and to eliminate any data-entry errors. Categorical attributes, choice question responses, and socio-economic information were recorded for each unique survey. The data were then manipulated for statistical analysis and model estimation.

varying characteristics given by 3 possible land types, 2 access options, 2 development risk levels, and 4 preservation methods. (3x2x2x4 =48 combinations of attributes).

Theory and Methods

Basic Theories and Justification

Stated preference methods, or choice experiments, are an established mechanism widely used to assess values people hold for environmental or resource management policies. In choice experiments, researchers estimate the values, or benefits, that people receive from preserving different resources. As noted above, stated preference surveys mimic public votes by placing respondents in realistic voting scenarios and asking them to make choices.

Within the choice experiment surveys, resource attributes are mixed-and-matched to allow respondents to consider and make choices over different types of policy bundles. For example, as detailed above, a land preservation program might be defined in terms of such attributes as the type of land preserved, the number of acres preserved, the means used to preserve the land, the risk of development on unpreserved lands, and other defining characteristics. By randomly selecting and grouping these attributes in different survey versions, respondents can be tested for their preferences over hundreds, if not thousands, of potential policy options. Many possible variations and attribute combinations are represented in different (unique) survey booklets. Each household receives a potentially different version of the survey and considers a small set of these policy possibilities.

In this survey, responses were used to estimate values of different types of land preservation programs, based on public willingness to pay additional taxes and fees in return for particular preservation options. As rational decision-makers, residents should consider all possible costs and benefits to their household when assessing public referendums or surveys, based on the same voting format. Knowing that their budgets are limited, the choice to support or reject land preservation programs reflects not only each household's overall value or desire to preserve these resources, but also takes into account the additional cost. If survey choices mimic actual referendum decisions, the value estimates obtained and aggregated over each community will provide an accurate representation of expected long-term benefits provided from land preservation.

Based on the statistical analysis of survey results[3], willingness to pay acre, per household, per year estimates are calculated for each possible land preservation option. For example, the estimated annual willingness to pay for a single acre of *forest land*, that

[3] Utilizing what is known as a Conditional Logit Model.

has a *low risk* of development, is *accessible* for passive recreation, and would be preserved through Connecticut *state contracts* is $0.42 per household in Woodstock. This estimate may be interpreted as an average of $0.42 per household, per year, that residents are willing to pay to preserve farmland with these particular attributes.

From these individual estimates, aggregated or total town-wide values for these options were also obtained. By aggregating across all households and accounting for the response rates from survey results, total willingness to pay for each type of land preservation were calculated, for each town as a whole. [4] These results indicate the total WTP per year of all residents in each town.

From this initial estimation, long-term capitalized values were also calculated to provide an estimate of the total benefits received from each preservation option over time. These capitalized estimates report the total lifetime value of an acre of land preserved, as well as the overall averages for each town. Capitalization implies summing all future benefits per acres over time, and discounting these values at an appropriate rate (in this case 6%) to estimate a present total value for each preserved acre. [5] The result of these calculations is an estimate of the total value of farmland preservation—which is directly comparable to the market cost of preservation—in each town.

[4] The number of housing units was obtained from U.S. Census 2000 data. Response rates were calculated from the total number of surveys sent to each town and the number of surveys returned. Total town-wide willingness to pay estimates are given as: WTP x no. housing units x response rates (%). This is a conservative assumption, in that it presumes that a percentage of town households equal to the percentage of households that did not return survey booklets has zero value for farmland preservation.

[5] Reporting a total discounted present value for each acre of preserved follows the same method that would be used in assessing the market value of the flow of revenues provided by a business or working farm. The present value is the sum of all the expected cash flows generated over time by that business. But future earnings or benefits are worth less than those benefits received today; reflecting the time value of money. As a result, all future benefits must be *discounted* to a comparable value before they can be added to the total expected value. By assuming a 6% discount rate, this means that a dollar earned next year is worth only $0.94, and a dollar earned two years from now is worth $0.89. These discounted values over time are then added together to estimate the total *capitalized* value for each acre of preserved land for each town.

Results and Findings

The following section reports the findings from the statistical analysis of survey results.[6] It summarizes model results and discusses implications for the value of land preservation in each community—as reflected by that which residents would be willing to pay to obtain different types of preservation. Comparisons of results across communities, and more detailed discussion of WTP findings within each community, are presented in later sections.

Survey results offer detailed insight to Connecticut residents' preferences and the preservation attributes that are most valued. Willingness to pay estimates obtained from survey results communicate the level of bond payments residents would be willing to support for each possible preservation option. From these results, local agencies and organizations can both prioritize available parcels considered for preservation and better justify the use of public funds. Preservation that targets land of higher values to residents may also encourage greater public support for such uses of public funds. As residents become confident that their values are appropriately represented in public policy decisions, these voters may be more likely to support future preservation policies.

We emphasize that the reported values reflect the WTP of town residents only. Prior work by the authors shows that residents elsewhere in Connecticut (i.e., in areas other than the community in which the land is preserved) are also willing to pay to preserve land in each town. These additional statewide values are reported in Appendix F. Hence, even for preservation types given a $0 value by the town-wide survey, there may still be very substantial values related to the WTP of residents in other towns, for farmland preserved in the specific town in question.

Table 5.1 reports the willingness to pay, per household, per acre, per year for each of the 48 land preservation options, as well as an average willingness to pay, across each town. A value of zero indicates that the average resident would not prefer to have funds allocated to preservation of that land type, and would instead prefer to have money spent preserving alternative types of land or on other public priorities. From these per acre, per household, per year willingness to pay estimates, **total annual values for each town were also calculated by accounting for the total number of households in each town and the overall response rates in the study.** These numbers, shown in table 5.2, reflect the estimated amount that **all town residents together** would be willing to

[6] While performing this study, several preliminary models were run to verify the robustness, essentially the accuracy or reliability, of the data provided in the survey responses. Estimates were statistically equivalent across each model, indicating that model findings are robust.

pay for the illustrated preservation options. Additional details of these results, as well as those from other models used for comparison, are provided in **Appendix D** of this report.

Within tables 5.1 and 5.2, preservation attributes are defined as follows:

- **Outright purchase** means purchase and preservation of farm and forest by state or town municipalities or nonprofit groups (land trusts).
- **Preservation contract** (also called *conservation easements* or *purchase of development rights*) means that interested landowners are paid a fee in return for placing a legal contract on their land that prevents all future development.
- **High risk** means land that is likely to be developed within the next 10 years if it is not preserved.
- **Low Risk** means that land is unlikely to be developed within the next 10 years if it is not preserved
- **Access / No Access** describes if land is open for passive recreational access.

Table 5.1. Estimated WTP in Four Towns *(per acre, per household, per year)*

Preservation Option*	Brooklyn	Pomfret	Thompson	Woodstock
Average WTP (per acre, per year, per household)	***$0.40***	***$0.49***	***$0.22***	***$0.35***
Forest/Orchard; Town Contracted Preservation; High Development Risk; No Access	$0.26	$0.49	$0.00	$0.09
Forest/Orchard; Town Contracted Preservation; Low Development Risk; No Access	$0.06	$0.17	$0.00	$0.00
Forest/Orchard; Town Contracted Preservation; High Development Risk; Access	$1.03	$0.89	$0.85	$1.08
Forest/Orchard; Town Contracted Preservation; Low Development Risk; Access	$0.83	$0.57	$0.84	$0.55
Forest/Orchard ; State Contracted Preservation; High Development Risk; No Access	$0.00	$0.29	$0.00	$0.00
Forest/Orchard ; State Contracted Preservation; Low Development Risk; No Access	$0.00	$0.00	$0.00	$0.00
Forest/Orchard ; State Contracted Preservation; High Development Risk; Access	$0.66	$0.69	$0.58	$0.95
Forest/Orchard ; State Contracted Preservation; Low Development Risk; Access	$0.46	$0.38	$0.57	$0.42
Forest/Orchard; State Purchase; High Development Risk; No Access	$0.00	$0.37	$0.00	$0.19
Forest/Orchard; State Purchase; Low Development Risk; No Access	$0.00	$0.06	$0.00	$0.00
Forest/Orchard; State Purchase; High Development Risk; Access	$0.75	$0.78	$0.84	$1.18
Forest/Orchard; State Purchase Low Development Risk; Access	$0.55	$0.46	$0.83	$0.65
Forest/Orchard; Town Purchase; High Development Risk; No Access	$0.00	$0.36	$0.00	$0.00
Forest/Orchard; Town Purchase; Low Development Risk; No Access	$0.00	$0.04	$0.00	$0.00
Forest/Orchard; Town Purchase; High Development Risk; Access	$0.63	$0.76	$0.65	$0.88
Forest/Orchard; Town Purchase; Low Development Risk; Access	$0.44	$0.44	$0.64	$0.35
Food/Field; Town Contracted Preservation; High Development Risk; No Access	$0.28	$0.55	$0.00	$0.05
Food/Field; Town Contracted Preservation; Low Development Risk; No Access	$0.09	$0.20	$0.00	$0.00
Food/Field; Town Contracted Preservation; High Development Risk; Access	$1.06	$0.95	$0.88	$1.03
Food/Field; Town Contracted Preservation; Low Development Risk; Access	$0.86	$0.64	$0.87	$0.50
Food/Field; State Contracted Preservation; High Development Risk; No Access	$0.00	$0.36	$0.00	$0.00
Food/Field; State Contracted Preservation; Low Development Risk; No Access	$0.00	$0.04	$0.00	$0.00
Food/Field; State Contracted Preservation; High Development Risk; Access	$0.69	$0.76	$0.61	$0.90
Food/Field; State Contracted Preservation; Low Development Risk; Access	$0.49	$0.44	$0.60	$0.37
Food/Field; State Purchase; High Development Risk; No Access	$0.00	$0.44	$0.00	$0.15
Food/Field; State Purchase; Low Development Risk; No Access	$0.00	$0.12	$0.00	$0.00
Food/Field; State Purchase; High Development Risk; Access	$0.77	$0.84	$0.87	$1.13
Food/Field; State Purchase Low Development Risk; Access	$0.58	$0.52	$0.86	$0.60
Food/Field; Town Purchase; High Development Risk; No Access	$0.00	$0.42	$0.00	$0.00
Food/Field; Town Purchase; Low Development Risk; No Access	$0.00	$0.10	$0.00	$0.00
Food/Field; Town Purchase; High Development Risk; Access	$0.66	$0.82	$0.67	$0.84
Food/Field; Town Purchase; Low Development Risk; Access	$0.46	$0.51	$0.66	$0.31
Livestock/Dairy; Town Contracted Preservation; High Development Risk; No Access	$0.58	$0.63	$0.00	$0.39
Livestock/Dairy; Town Contracted Preservation; Low Development Risk; No Access	$0.38	$0.31	$0.00	$0.00
Livestock/Dairy; Town Contracted Preservation; High Development Risk; Access	$1.35	$1.03	$1.00	$1.37
Livestock/Dairy; Town Contracted Preservation; Low Development Risk; Access	$1.15	$0.72	$0.99	$0.84
Livestock/Dairy; State Contracted Preservation; High Development Risk; No Access	$0.21	$0.44	$0.00	$0.26
Livestock/Dairy; State Contracted Preservation; Low Development Risk; No Access	$0.01	$0.12	$0.00	$0.00
Livestock/Dairy; State Contracted Preservation; High Development Risk; Access	$0.98	$0.84	$0.73	$1.24
Livestock/Dairy; State Contracted Preservation; Low Development Risk; Access	$0.78	$0.52	$0.72	$0.71
Livestock/Dairy; State Purchase; High Development Risk; No Access	$0.29	$0.52	$0.00	$0.49
Livestock/Dairy; State Purchase; Low Development Risk; No Access	$0.10	$0.20	$0.00	$0.00
Livestock/Dairy; State Purchase; High Development Risk; Access	$1.07	$0.92	$0.99	$1.47
Livestock/Dairy; State Purchase Low Development Risk; Access	$0.87	$0.60	$0.98	$0.94
Livestock/Dairy; Town Purchase; High Development Risk; No Access	$0.18	$0.50	$0.00	$0.19
Livestock/Dairy; Town Purchase; Low Development Risk; No Access	$0.00	$0.18	$0.00	$0.00
Livestock/Dairy; Town Purchase; High Development Risk; Access	$0.95	$0.90	$0.80	$1.18
Livestock/Dairy; Town Purchase; Low Development Risk; Access	$0.75	$0.58	$0.79	$0.65

Table 5.2. Annual Total WTP (per acre, per year, per Town)

Preservation Option	Brooklyn	Pomfret	Thompson	Woodstock
Average WTP	***$450.38***	***$410.08***	***$334.98***	***$492.38***
Forest/Orchard; Town Contracted Preservation; High Development Risk; No Access	$293.59	$407.83	$0	$133.13
Forest/Orchard; Town Contracted Preservation; Low Development Risk; No Access	$73.81	$144.55	$0	$0
Forest/Orchard; Town Contracted Preservation; High Development Risk; Access	$1,155.57	$742.13	$1,260.40	$1,514.27
Forest/Orchard; Town Contracted Preservation; Low Development Risk; Access	$935.79	$478.86	$1,247.24	$771.54
Forest/Orchard ; State Contracted Preservation; High Development Risk; No Access	$0	$246.93	$0	$0
Forest/Orchard ; State Contracted Preservation; Low Development Risk; No Access	$0	$0	$0	$0
Forest/Orchard ; State Contracted Preservation; High Development Risk; Access	$742.40	$581.23	$860.92	$1,333.77
Forest/Orchard ; State Contracted Preservation; Low Development Risk; Access	$522.62	$317.96	$847.76	$591.04
Forest/Orchard; State Purchase; High Development Risk; No Access	$0	$314.38	$0	$272.38
Forest/Orchard; State Purchase; Low Development Risk; No Access	$0	$51.10	$0	$0
Forest/Orchard; State Purchase; High Development Risk; Access	$840.53	$648.68	$1,247.16	$1,653.52
Forest/Orchard; State Purchase Low Development Risk; Access	$620.75	$385.41	$1,234.00	$910.79
Forest/Orchard; Town Purchase; High Development Risk; No Access	$0	$299.23	$0	$0
Forest/Orchard; Town Purchase; Low Development Risk; No Access	$0	$35.96	$0	$0
Forest/Orchard; Town Purchase; High Development Risk; Access	$711.29	$633.54	$959.94	$1,244.28
Forest/Orchard; Town Purchase; Low Development Risk; Access	$491.51	$370.27	$946.78	$501.55
Food/Field; Town Contracted Preservation; High Development Risk; No Access	$323.65	$461.19	$0	$71.62
Food/Field; Town Contracted Preservation; Low Development Risk; No Access	$103.86	$197.92	$0	$0
Food/Field; Town Contracted Preservation; High Development Risk; Access	$1,185.63	$795.50	$1,299.97	$1,452.76
Food/Field; Town Contracted Preservation; Low Development Risk; Access	$965.85	$532.22	$1,286.81	$710.03
Food/Field; State Contracted Preservation; High Development Risk; No Access	$0	$300.29	$0	$0
Food/Field; State Contracted Preservation; Low Development Risk; No Access	$0	$37.02	$0	$0
Food/Field; State Contracted Preservation; High Development Risk; Access	$772.46	$634.60	$900.49	$1,272.27
Food/Field; State Contracted Preservation; Low Development Risk; Access	$552.68	$371.32	$887.33	$529.54
Food/Field; State Purchase; High Development Risk; No Access	$8.61	$367.74	$0	$210.88
Food/Field; State Purchase; Low Development Risk; No Access	$0	$104.47	$0	$0
Food/Field; State Purchase; High Development Risk; Access	$870.59	$702.05	$1,286.73	$1,592.01
Food/Field; State Purchase Low Development Risk; Access	$650.81	$438.77	$1,273.57	$849.28
Food/Field; Town Purchase; High Development Risk; No Access	$0	$352.60	$0	$0
Food/Field; Town Purchase; Low Development Risk; No Access	$0	$89.33	$0	$0
Food/Field; Town Purchase; High Development Risk; Access	$741.35	$686.91	$999.51	$1,182.77
Food/Field; Town Purchase; Low Development Risk; Access	$521.57	$423.63	$986.35	$440.04
Livestock/Dairy; Town Contracted Preservation; High Development Risk; No Access	$649.97	$526.89	$0	$548.19
Livestock/Dairy; Town Contracted Preservation; Low Development Risk; No Access	$430.19	$263.61	$0	$0
Livestock/Dairy; Town Contracted Preservation; High Development Risk; Access	$1,511.95	$861.19	$1,481.33	$1,929.33
Livestock/Dairy; Town Contracted Preservation; Low Development Risk; Access	$1,292.17	$597.92	$1,468.18	$1,186.60
Livestock/Dairy; State Contracted Preservation; High Development Risk; No Access	$236.79	$365.99	$0	$367.70
Livestock/Dairy; State Contracted Preservation; Low Development Risk; No Access	$17.01	$102.71	$0	$0
Livestock/Dairy; State Contracted Preservation; High Development Risk; Access	$1,098.78	$700.29	$1,081.85	$1,748.84
Livestock/Dairy; State Contracted Preservation; Low Development Risk; Access	$879.00	$437.02	$1,068.70	$1,006.11
Livestock/Dairy; State Purchase; High Development Risk; No Access	$334.93	$433.43	$0	$687.45
Livestock/Dairy; State Purchase; Low Development Risk; No Access	$115.15	$170.16	$0	$0
Livestock/Dairy; State Purchase; High Development Risk; Access	$1,196.92	$767.74	$1,468.10	$2,068.58
Livestock/Dairy; State Purchase Low Development Risk; Access	$977.13	$504.47	$1,454.94	$1,325.85
Livestock/Dairy; Town Purchase; High Development Risk; No Access	$205.68	$418.29	$0	$278.21
Livestock/Dairy; Town Purchase; Low Development Risk; No Access	$0	$155.02	$0	$0
Livestock/Dairy; Town Purchase; High Development Risk; Access	$1,067.67	$752.60	$1,180.88	$1,659.34
Livestock/Dairy; Town Purchase; Low Development Risk; Access	$847.89	$489.32	$1,167.72	$916.61

As shown by Tables 5.1 and 5.2, the annual per acre values can be substantial, particularly when aggregated across the appropriate number of town households. These numbers may be interpreted as the yearly amount that each household (Table

5.1) or the entire town (Table 5.2) would be willing to pay in a bond payment or other vehicle to secure each type of preservation noted in the tables.

When interpreting results across towns, it is important to recognize that towns with higher populations will—all else equal—tend to have higher per acre values in Table 5.2. Hence, comparisons across towns using the results from this table should be made with caution. In contrast, Table 5.1 reports per household values. Because these values are independent of the number of households in each town, they may be more easily compared across towns.

What do Zero WTP Values Mean?

Zero values should be interpreted with caution. A zero value implies that, given the choices presented to respondents, the average household would prefer to have their tax dollars directed to other types of preservation and priorities. Zero average values do **not** imply that all households have zero value for that type of preservation. Also, it is important to realize that all estimates have a degree of statistical variation—so that an estimated zero value might mean that the true value is actually a small positive number, but that the number is too small to be estimated with any precision given the number of surveys collected. Hence, the most appropriate interpretation is that zero WTP values reflect land preservation that is considered low priority by the average survey respondent.

Capitalization of Values Over Time

From the results presented above (Tables 5.1 and 5.2), one may calculate long-term capitalized values to provide an estimate of the total benefits received from each preservation option over time. Capitalization implies summing all future benefits per acre over time, and discounting these values at an appropriate rate (in this case 6%) to estimate a present total value for each preserved acre. Tables 5.3 and 5.4 demonstrate how yearly WTP values accumulate over time. Table 5.3 illustrates the capitalization of average per household WTP over different time periods. For example, a single preserved acre of land preserved in Woodstock would be expected to be valued at $0.35 per acre each year. Over ten years, this translates into a discounted value of $2.94 per acre, per household (this is the present value of $0.35 WTP each year for 10 years at a 6% discount rate). Over 50 years, that same acre of land is valued at $5.89 per household.

Table 5.3. Average Capitalized WTP per acre, per household, per year (at 6%)

	First Year	10 years	20 years	30 years	50 years	75 years	100 years
Woodstock	$0.35	$2.94	$4.38	$5.19	$5.89	$6.14	$6.21
Brooklyn	$0.40	$3.37	$5.03	$5.95	$6.76	$7.04	$7.12
Pomfret	$0.49	$4.13	$6.16	$7.29	$8.28	$8.62	$8.72
Thompson	$0.23	$1.90	$2.83	$3.35	$3.81	$3.97	$4.01

As shown by Table 5.4, if this per acre value were multiplied by the number of households in each town, (adjusted by the percentage of survey responses from this study), the result is a conservative estimate of total capitalized willingness to pay in each town. These values represent average benefits that the residents anticipate from the preservation of an acre of farmland. So, if an acre of land was preserved for only thirty years, these values represent the overall willingness to pay over those thirty years in support of preservation.

Table 5.4. Average Capitalized WTP per acre (at 6%)

	First Year	10 years	20 years	30 years	50 years	75 years	100 years
Woodstock	$492.38	$ 4,116.32	$ 6,139.92	$ 7,269.88	$ 8,253.17	$ 8,594.88	$ 8,698.68
Brooklyn	$450.38	$ 3,765.20	$ 5,616.18	$ 6,649.76	$ 7,549.18	$ 7,861.73	$ 7,956.68
Pomfret	$410.08	$ 3,428.32	$ 5,113.69	$ 6,054.79	$ 6,873.73	$ 7,158.33	$ 7,244.78
Thompson	$334.98	$ 2,800.46	$ 4,177.17	$ 4,945.92	$ 5,614.88	$ 5,847.36	$ 5,917.98

For preservation that is considered permanent, it is most appropriate to capitalize over long time periods. Capitalized WTP estimates that are reported in subsequent sections of this report are based on a 100 year capitalization.

Comparisons Across Towns

Results show that residents within the four communities support the preservation of farmland and open space, as reflected by an often significant household willingness to pay for farmland preservation. On average, willingness to pay per household, per acre, per year for farmland preservation ranges from $0.22 in Thompson to $0.49 in Pomfret. Aggregating these values over town households and time periods results in town-wide capitalized per acre WTP estimates that range from $5,917 in Thompson to $8,699 in Woodstock. Analogous values in Brooklyn and Pomfret are $7,957 and $7,245 per acre, respectively.

As shown by Tables 5.1 and 5.2 above, some preservation values are quite similar across different towns, while other values differ to a substantial degree. This section provides additional discussion of areas where results are either particularly similar or dissimilar across model results for different towns. Subsequent sections provided detailed discussion of results for each individual town.

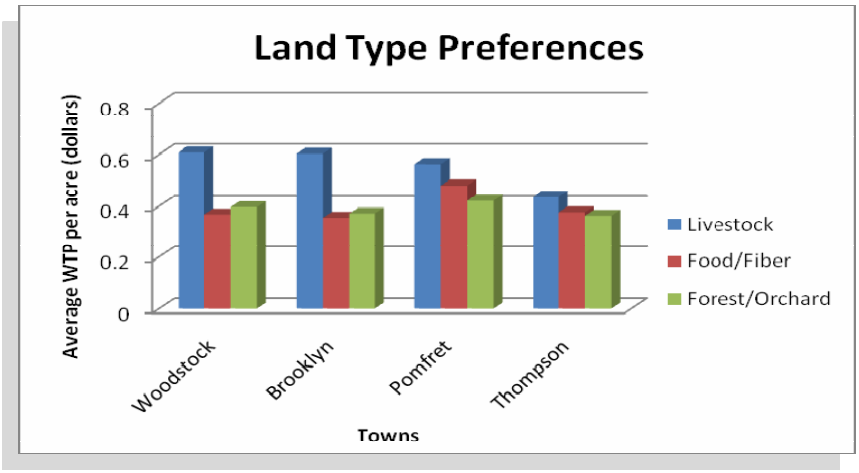
Review of Table 5.1, for example, shows that average per household, per year WTP averaged over all preservation types varies by approximately a factor of two over towns—WTP estimates ranging from $0.22 in Thompson to $0.49 in Pomfret. However, because of differences in town populations, the town with the highest per household average WTP is not the town with the highest total WTP (over all households). When aggregating WTP over town households, the per year value per acre varies from $334.98 in Thompson to $492.38 in Woodstock. Such numbers reflect the total extent of bond payments that town residents would be willing to support in order to obtain an average farmland preservation policy, per acre of land preserved.

Although total WTP differs across towns, there are many similarities in preservation priorities. For example, as illustrated by Figure 6.1, residents of all four towns tend to value the preservation of lands utilized for livestock or dairy production more than the preservation of other land types, holding all else constant. While the size and statistical significance of this effect varies across towns, point estimates of WTP for livestock/dairy preservation are always higher than for other types of land, holding other preservation attributes the same.

The figure illustrates the average WTP per acre, per household, per year associated with different land types. The apparent preference for livestock and dairy preservation corresponds to findings of the 2000 CSRA Survey on Connecticut Attitudes toward Farmland Preservation, which show that about 93 percent of Connecticut residents feel that the presence of dairy farms in the state was very important (67 percent stating very

important, 26 percent stating somewhat important). In comparison, only 72 percent of residents felt that orchards and vegetable farms were important within the state.

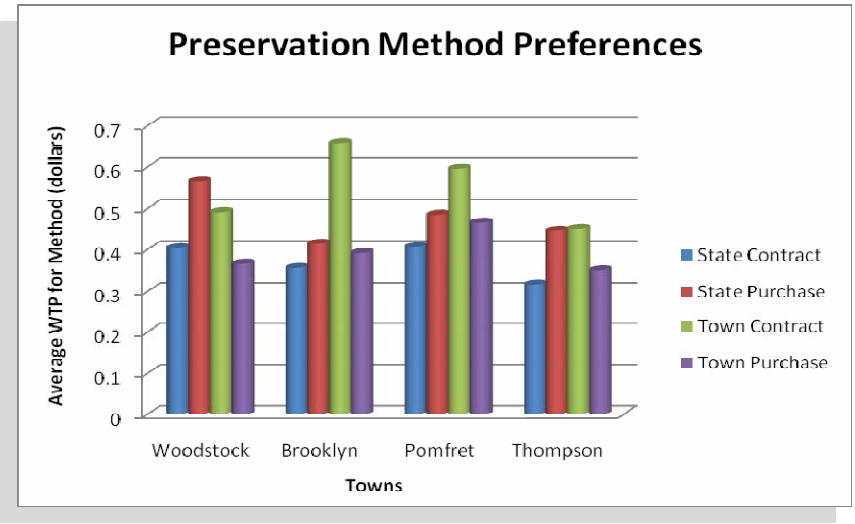
Figure 6.1. Average WTP by Land Type (per household/acre/year)



In addition to agreement on the types of land that are most valued, residents of the four towns share a preference for preservation programs that target parcels at high risk of development, compared to otherwise similar programs that target lands at lower development risk. Public access also has a large relative impact on willingness to pay for preservation, with residents of all four towns willing to pay larger amounts to preserve land with some degree of access.

Other preferences are common between two or three of the towns in this study, but not all four. For example, as illustrated by Figure 6.2, residents the towns of Brooklyn, Pomfret, and Thompson prefer preservation conducted using conservation easements implemented by the town. In contrast, residents of Woodstock prefer outright purchase by the state. Similarly, these three towns find forest/orchard lands the least desirable land type, while Woodstock finds food/fiber land the least valuable.

Figure 6.2. Average WTP by Preservation Method (per household/acre/year)



It is also possible to illustrate inter-town comparisons across particular preservation options. For example, Table 6.1 provides a 'snapshot' of a few preservation options and how willingness to pay for these options varies across towns. These results reflect the overall capitalized values for the illustrated preservation options – accounting for the lifetime value per acre to the entire town.

Table 6.1. Sample Preservation Options

	Woodstock	Brooklyn	Pomfret	Thompson
Forest/Orchard ; State Contracted Preservation; Low Development Risk; No Access	$0.00	$0.00	$0.00	$0.00
Forest/Orchard; Town Purchase; Low Development Risk; Access	$8392.75	$8205.90	$6181.99	$15829.11
Livestock/Dairy; Town Contracted Preservation; High Development Risk; Access	$32512.67	$25402.61	$14437.50	$24828.32

This example provides insight to ways in which capitalized values may vary across towns. In some cases values are very similar or identical—for example a low risk, non-accessible forest is valued at $0.00 for all four towns. However, if one adds public access and changes preservation method, the variation in value is substantial and differs across towns. The remaining capitalized willingness to pay values are provided in **Appendix D** of this report.

General Priorities for Preservation Outcomes

Results differ across towns, as summarized in more detail below. As a generalization, survey responses show that residents give the most relative weight, on average, to public access (i.e., whether preserved land provides access) and development risk (i.e., whether the land is likely to be developed within the next 10 years if not preserved). Preservation method and land type were given moderate weight in determining the public's willingness to pay for preservation. More details are provided below.

Comparison to Non-Studied Towns

Results above show that WTP values can differ between the studied communities. Equally, it is important to emphasize that these values and preferences estimated here are *not* directly transferable to other unstudied towns and communities. Although certain trends may appear in many communities, the extent to which residents are willing to support farmland preservation differs across each town. Hence, conclusions regarding values in towns not studied here should be made only with great caution.

Detailed Town Results

The following sections summarize specific results for each town. When interpreting these results, it is important to note that they indicate a conservative estimate of public WTP for preservation, and then only the WTP of each town's residents. Also it is important to note that these results do not say anything about the market *cost* of preservation, which is determined by a number of outside factors. Determination of the optimality of preserving any given parcel will require one to balance benefits (WTP) with costs. Even the highest-priority parcels (from a WTP perspective) may not be optimal to preserve, if the landowner requires a price that is too high in relation to WTP or in relation to other preservation alternatives in the town. In sum, policymakers must consider both benefits (reported here) and costs when making preservation decisions.

Brooklyn

Survey responses for Brooklyn residents reveal willingness to pay per household, per acre, per year for the 48 different types of preservation addressed by survey questions. Aggregating (or summing) responses over Brooklyn households provides an estimate of total annual value per acre among Brooklyn residents. This analysis aggregates over 41% of Brooklyn households (2,708 total), the same proportion of households as those who responded to the survey questionnaire. This is a conservative assumption, in that it assumes that the 59% of survey recipients who did not respond chose not to respond because they had zero willingness to pay for land preservation. Annual values are capitalized over time by discounting the future cash flows at a 6% discount rate.

Based on these methods, **the average value that Brooklyn residents place on preserving each additional acre of farm or forest in their town is $450.38 per year, or $7,956.68 in total capitalized value.** Preservation values differ depending on land attributes and the type of preservation. The highest preservation values obtained in this survey were in excess of $25,000 per acre in capitalized value. Higher values were associated with land at a high risk of development and land that offers public access. Total statewide WTP includes both the values of Brooklyn residents and those of residents in other Connecticut towns (for preservation in Brooklyn). A sample of these statewide values, estimated by prior research, are presented in Appendix F.

Figure 6.3 provides a summary of total capitalized values across Brooklyn residents. These values are designed to be directly compared to the per acre cost of land preservation. If values in table 6.3 exceed the per acre cost of preservation, then preservation passes a "benefit-cost test" and is a good value for the town. By cross-

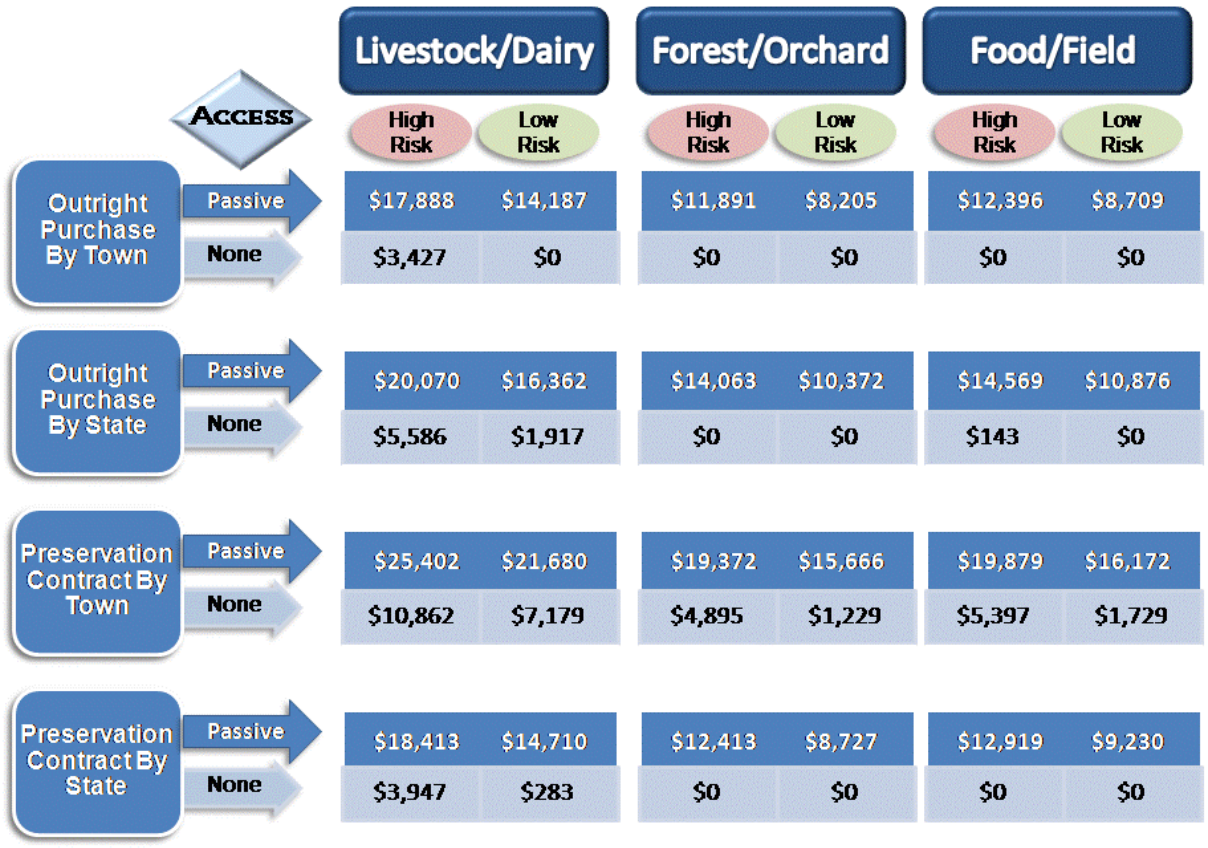
referencing preservation methods and types of land, specific preservation values may be located. As an example, to find the value for the Town of Brooklyn to purchase an acre of land that is used for *forestry or orchards*, is accessible by residents, and has a high risk of development, one would navigate the table and find that the capitalized value **is $11,891.44 per acre**.

Further examination of the results shows that Brooklyn residents have different preferences and values for different types of preservation. The land type most highly valued is farmland used for dairy or livestock production. However, preferences and WTP for other types of farmland (cropland versus forest/nursery) are statistically identical. Other preference patterns are also notable. For example, public access to preserved lands was a major factor in overall willingness to pay. Residents, while valuing the aesthetic qualities of farmland, prefer to maintain parcels that can also be enjoyed through passive access. This is not a surprising result. As might also be expected, Brooklyn residents also prefer to invest in the preservation of farmland that is at higher risk of development. Preservation method also influences willingness to pay for preservation in Brooklyn. As noted above, residents preferred preservation accomplished using Town conservation easements. Outright purchase by the town is least valued by Brooklyn residents.

Overall, the option most highly valued by Brooklyn residents is the preservation of livestock/dairy land using town conservation easements, where the land is at a high risk of development and allows some level of public access. For this option, residents were willing to pay $1.35 per acre, per household, per year, leading to a total capitalized value of $25,402.

Compared to other towns, Brooklyn WTP results are moderately responsive to preservation type. WTP for the most highly-valued preservation types are fairly large, while there are also a significant number of preservation types with low or zero values. This shows that preservation type can have fairly substantial impacts on public support and WTP among Brooklyn residents.

Figure 6.3. Per Acre Preservation Value for Town of Brooklyn, Connecticut



Pomfret

Survey responses reveal willingness to pay per household, per acre, per year for the type of farmland specified in the survey questions. Aggregating (or summing) responses over Pomfret households provides an estimate of total annual value per acre, among Pomfret residents.[7] Annual values are capitalized over time by discounting the future cash flows at a 6% discount rate. Total statewide WTP includes both the values of Pomfret residents and those of residents in other Connecticut towns (for preservation in Pomfret). A sample of these statewide values, estimated by prior research, are presented in Appendix F.

Based on these methods, the **average value that Pomfret residents place on preserving each additional acre of farm or forest in their town is $410.08 per year, or $ 7,244.78 in total capitalized value.** Preservation values differ depending on land attributes and the type of preservation. The highest preservation values obtained in this survey are in excess of $14,000 per acre in capitalized value. Higher values were associated with land at a high risk of development and land that offers public access. **Interestingly, per household values are higher in Pomfret, on average, than in any other studied town. However, because the town has a relatively small population, total capitalized values are not the highest (that distinction being held by Woodstock).**

Figure 6.4 provides a summary of total capitalized values across Pomfret residents. By cross-referencing preservation methods and types of land, specific preservation values may be located. As an example, to find the value for the Town of Pomfret to purchase an acre of land that is farmed for *fruit (orchard)*, is accessible by residents, and has a high risk of development, one would navigate the table and find that the capitalized value is **$10,600.89 per acre**.

Examination of willingness to pay results shows that Pomfret residents have clear preferences for specific types of preservation—although not all attributes have a significant impact on WTP. For example, the type of land considered has a small and statistically insignificant[8] impact on WTP. Pomfret residents appear support the preservation of most types of land equally. Similarly, preservation method has only a small impact on WTP—statistically indistinguishable from zero. Public access, in contrast, is a major factor in the overall value of preservation to town residents. Residents value the ability to use farmland for passive recreation. Also, Pomfret residents prefer to invest in the preservation of farmland that is at higher risk of development.

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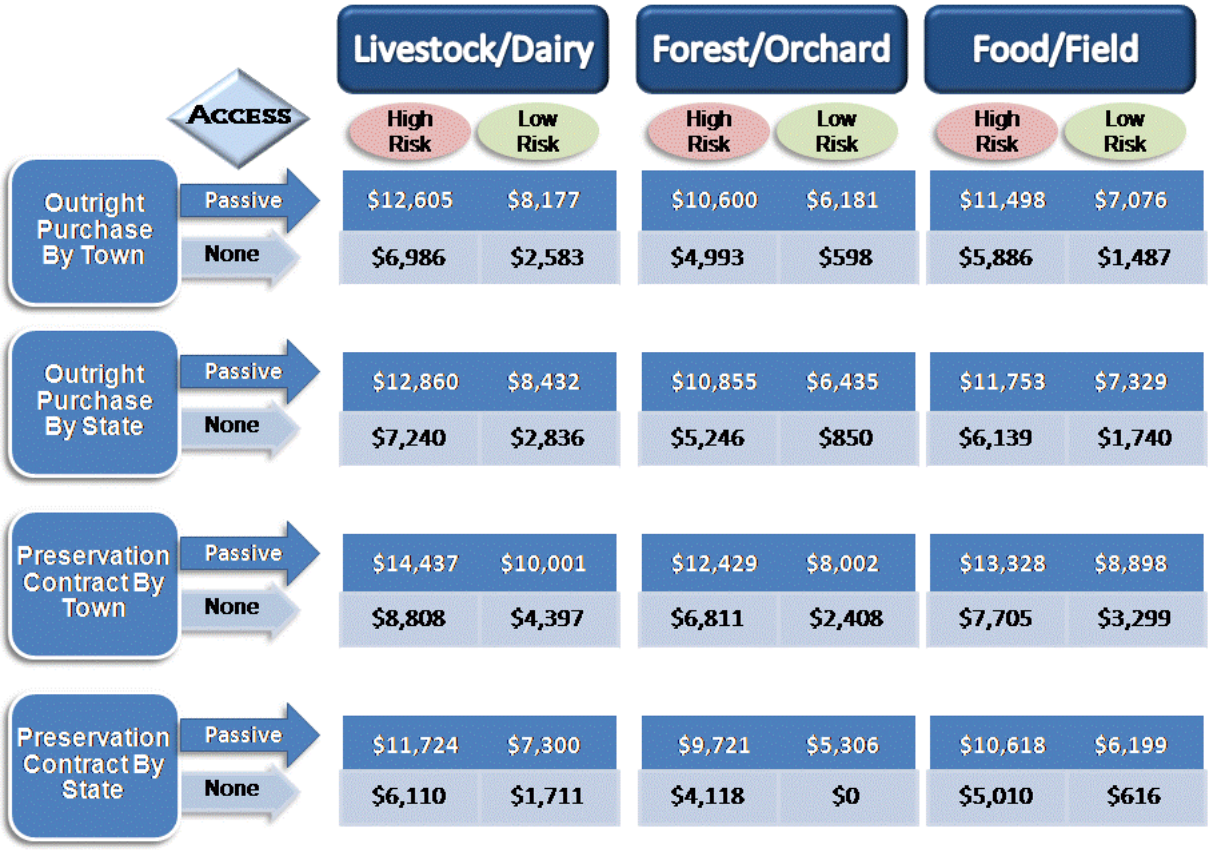
[7] This analysis aggregates over 55% of Pomfret households (1,503 total), the same proportion of households as those who responded to the survey questionnaire. This is a conservative assumption, in that it assumes that the 45% of survey recipients who did *not* respond chose not to respond because they had zero willingness to pay for land preservation.

[8] This means that from a statistical perspective, the difference in WTP is for all intents and purposes equal to zero.

Overall, the most highly valued preservation option is that for a livestock/dairy farm preserved using town easements, where the land is at high risk of development and preservation offers some level of public access. Although WTP of Pomfret residents is responsive to some preservation attributes, it is less variable than that of residents of all other studied towns. That is, compared to other towns, total capitalized WTP values of Pomfret residents are more homogeneous (similar) across preservation types. Moreover, unlike residents in the other three towns, Pomfret residents are willing to pay non-zero amounts for nearly all types of preservation.

Figure 6.4. Per Acre Preservation Value for Town of Pomfret, Connecticut



Thompson

Survey responses reveal willingness to pay per household, per acre, per year for the type of farmland specified in the survey questions. Aggregating (or summing) responses over Thompson households provides an estimate of total annual value per acre, among Thompson residents.[9] Annual values are capitalized over time by discounting the future cash flows at a 6% discount rate. Total statewide WTP includes both the values of Thompson residents and those of residents in other Connecticut towns (for preservation in Thompson). A sample of these statewide values, estimated by prior research, are presented in Appendix F.

The **average value that Thompson residents place on preserving each additional acre of farm or forest in their town is $334.98 per year, or $5,917.98 in total capitalized value.** Preservation values differ depending on land attributes and the type of preservation. The highest preservation values obtained in this survey were in excess of $24,000 per acre in capitalized value. Figure 6.5 summarizes total capitalized values for Thompson residents. As an example, to find the value for the Town of Thompson to purchase an acre of land that is farmed for *fruit (orchard),* is accessible by residents, and has a high risk of development, one would navigate the table and find that the capitalized value **is $16,050.06 per acre**.

Thompson results show a high degree of WTP responsiveness to public access. Thompson residents place such large value on access that average survey respondents were willing to pay $0.00 per acre of land without access to town residents (but, see important caveats on the interpretations of these results discussed above). This response is characteristic of an expectation that preserved lands should offer access, and is perhaps related to existing patterns of land preservation within the town's borders. Quaddick State Park, for example, is a large parcel of farmland that has been converted to a recreational park; therefore, it is possible that town residents expect that similar recreational access should be provided on the majority of preserved parcels.

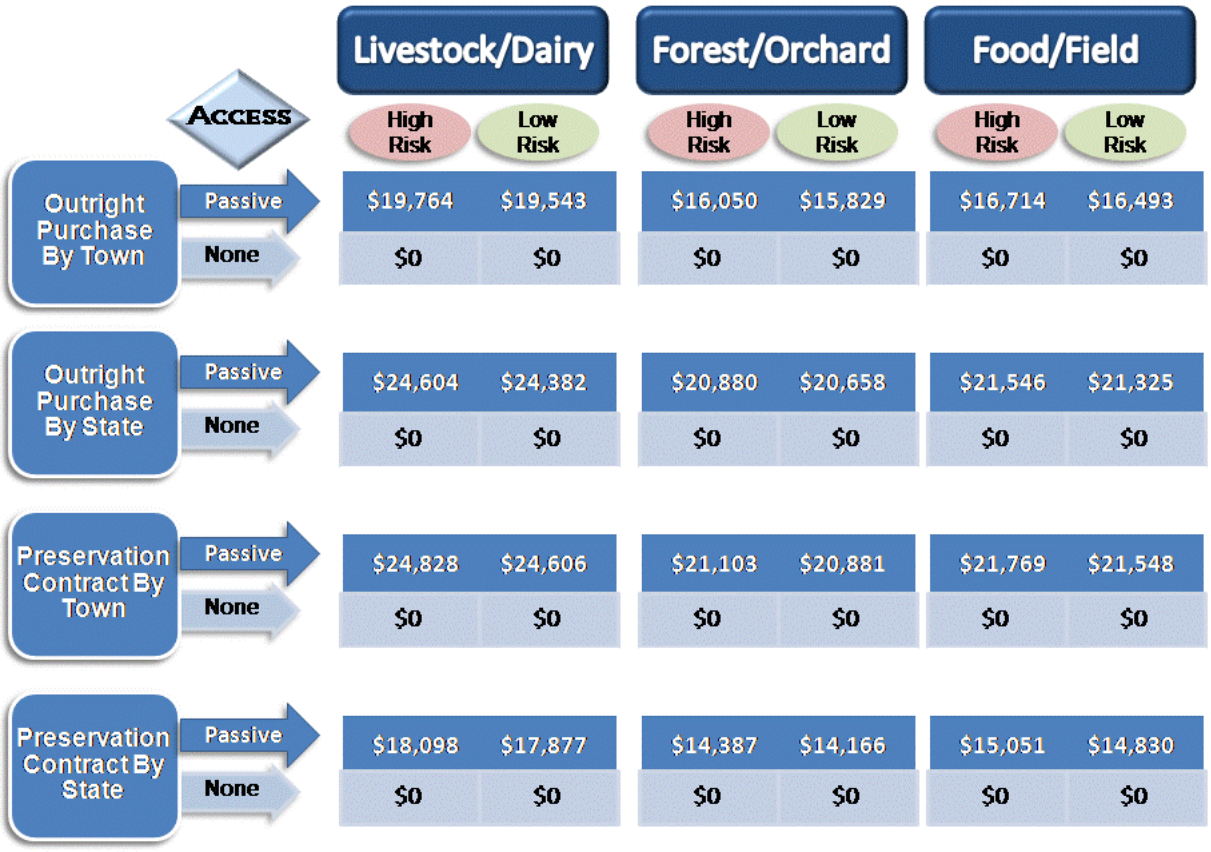
Differences in value related to other preservation attributes are in general fairly small—and in most cases statistically indistinguishable from zero. As in most other towns, Thompson residents prefer town easements as a preservation method. State easements are the least preferred method. Preservation of livestock/dairy farms also generates a higher point-estimate of WTP, compared to other land types. Overall, the

[9] This analysis aggregates over 40% of Thompson households (3,710 total), the same proportion of households as those who responded to the survey questionnaire. This is a conservative assumption, in that it assumes that the 60% of survey recipients who did *not* respond chose not to respond because they had zero willingness to pay for land preservation.

most highly valued preservation option is that for a livestock/dairy farm preserved using town easements, where the land is at high risk of development and preservation offers some level of public access.

In general, Thompson is distinguished by the dominant role of public access in the valuation of land preservation options. This leads to a large number of very large WTP estimates in cases where access is provided, combined with a large number of zero values in cases where access is not provided. Nonetheless, the average WTP is still substantial, exceeding $5,500 per acre in total capitalized value.

Figure 6.5. Per Acre Preservation Value for Town of Thompson, Connecticut



Woodstock

Survey responses reveal willingness to pay per household, per acre, per year for the type of farmland specified in the survey questions. Aggregating (or summing) responses over Woodstock households provides an estimate of total annual value per acre, among Woodstock residents.[10] Annual values are capitalized over time by discounting the future cash flows at a 6% discount rate. Total statewide WTP includes both the values of Woodstock residents and those of residents in other Connecticut towns (for preservation in Woodstock). A sample of these statewide values, estimated by prior research, are presented in Appendix F.

Based on these methods, the average **value that Woodstock residents place on preserving each additional acre of farm or forest in their town is $492.38 per year, or $8,698.68 in total capitalized value.** Preservation values differ depending on land attributes and the type of preservation. The highest preservation values obtained in this survey were in excess of $32,000 per acre in capitalized value—the highest value found in any of the four towns. Higher values were associated with land at a high risk of development and land that offers public access. Figure 6.6 provides a summary of the total capitalized values of Woodstock residents. For example, to find the value for the Town of Woodstock to purchase an acre of land that is farmed for *fruit (orchard)*, is accessible by residents, and has a high risk of development, one would navigate the table and find that the capitalized value is **$20,897.83 per acre**.

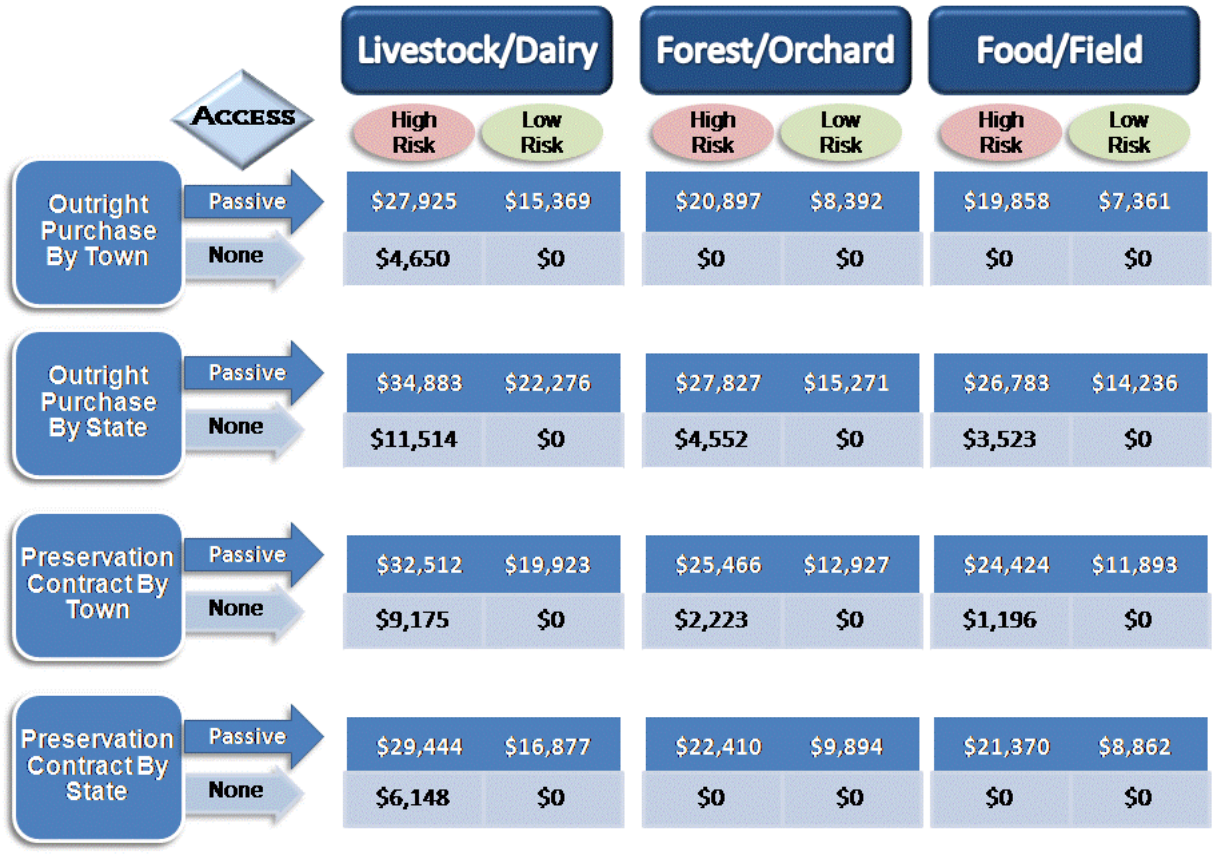
Examination of model results shows that the WTP of Woodstock residents is highly responsive to preservation type—and indeed more responsive than WTP found in any of the other four towns. The land type most highly preferred is farmland used for dairy or livestock production. Public access is also a major factor in the overall value, as is risk of development on unpreserved parcels. Unlike other towns, however, Woodstock residents most highly value preservation accomplished using outright state purchase. Town purchase is the least valued method. Overall, the most highly valued preservation option by Woodstock residents is the state purchase of livestock/dairy land subject to a high risk of development, and that offers some level of public access.

Results for Woodstock stand out for the high degree of variability in WTP associated with different types of land and preservation. Compared to other towns, WTP in Woodstock is most responsive to the specifics of the preservation program—survey results are

[10] This analysis aggregates over 55% of Woodstock households (1,503 total), the same proportion of households as those who responded to the survey questionnaire. This is a conservative assumption, in that it assumes that the 45% of survey recipients who did *not* respond chose not to respond because they had zero willingness to pay for land preservation.

characterized by a relatively large number of high values, combined with a fairly significant number of zero values. This stands in contrast to towns such as Pomfret, whose values are much more stable over different types of preservation.

Figure 6.6. Per Acre Preservation Value for Town of Woodstock, Connecticut



Conclusions

Community farmland preservation programs may face barriers from financial planning committees or other town governing boards because of limited direct evidence as to how much residents are willing to pay for the preservation of desirable parcels, and the degree to which they support farmland preservation. Preservation efforts may be blocked or delayed by decision makers who perceive associated expenditures as "excessive spending" that lacks public support. Hence, even when public values for farmland preservation are substantial, lack of quantified WTP estimates can prevent these significant values from influencing policy decisions. This report details results of a survey addressing residents' willingness to pay for farmland preservation within four Connecticut towns: Brooklyn, Thompson, Pomfret, and Woodstock. The goal of the analysis is to provide the best estimates possible of the true values that town residents hold for various types of farmland preservation activities, such that more informed policy decisions can be encouraged.

Results show that residents within the four communities support the preservation of farmland and open space. The level to which residents within each town are willing to pay for (or support) preservation, however, often depends on the specific attributes of preservation programs. As an example, residents of most towns value the preservation of livestock and/or dairy farms somewhat more than the preservation of other farm types. Residents also tend to prefer preservation programs that target lands at high development risk, compared to otherwise identical programs that target lands at lower risk of development. Public access also has a significant impact on willingness to pay for preservation, with residents of all four towns willing to pay larger amounts to preserve land with some degree of access.

Despite the many similarities in public preferences that are shared across the four towns, there are also notable differences. For example, while residents of all towns indicate substantial willingness to pay for farmland preservation on average, the types of preservation that are most highly valued sometimes differ across towns. Also, the variability of willingness to pay differs across towns, with some towns expressing similar value for many types of preservation, and others expressing very large differences in willingness to pay depending on the specific attributes of a preservation program.

Overall, study findings suggest that a wide array of preservation attributes influence the degree of public support for farmland preservation and associated willingness to pay. Although land preservation initiatives generally receive strong public support, this study reveals that public support may vary considerably depending on the specific ways in which preservation is conducted and the types of lands that are preserved. Agencies or organizations that ignore such preferences when conducting preservation may

promote policies that—contrary to the best intentions—face a lack of public support. In contrast, appropriate use of such findings can assist towns in prioritizing preservation activities, and allocating public funds, in a way that will maximize public support and the well-being of local residents.

Appendix A : Model Details

The Conditional Logit Model and applications to this study

Stated preference choice experiments rely on a utility specification known as the random utility model (RUM), in which individual utility is divided into observable and random (unobservable) components (Hanemann, 1984). This specification allows estimation of contingent choice models using discrete choice conditional logit or probit models, described by Maddala (1983). These approaches model the probability that a respondent will choose a particular policy option, given the attributes that option compared to those of alternative options.

The empirical estimation draws from a standard random utility model (Hanemann, 1984). The household utility from preservation program *i* is assumed to be given by

$$U_i(\mathbf{X_i}, Y - Fee_i) = v_i(\mathbf{X_i}, Y - Fee_i) + e_i \qquad (1)$$

where

$\mathbf{X_i}$ = vector of variables characterizing attributes of preservation program *i*;

Fee_i = cost to household *h* of preservation plan *i*, through a mandatory payment vehicle;

Y = disposable household income;

$v_i(\cdot)$ = function representing the empirically measurable component of utility;

e_{ihk} = unobservable component of utility, modeled as econometric error.

Given the above specification, the household chooses among three policy plans, (*j*=*A*,*B*,*N*). It may choose option *A*, option *B*, or may reject both options and choose the status quo (neither plan, *j*=N). A choice of neither plan would result in zero preservation ($\mathbf{X_i}$=0) and household cost, (Fee_i=*0*). The household assesses utility resulting from available options and chooses that which offers the greatest utility. For example, the household will choose plan A if

$$v_A(\mathbf{X_A}, Y - Fee_A) + e_A \geq v_z(\mathbf{X_z}, Y - Fee_z) + \varepsilon_A. \qquad (2)$$

A model of this preference function is estimated by methods designed for limited dependent variables, because analysts only observe the choice among A, B, and N, rather than observing U_i directly (Maddala, 1983). This analysis is based on the probability that a respondent's value for U_i exceeds his or her value for all U_z, for all values of z such that $i,j \in \{A, B, N\}$ with $z \neq i$. From model (1), welfare impacts (i.e., monetized non-market values) are derived using established methods (Hanemann, 1984).

Given the above RUM model, the probability of voting for any particular farmland preservation program is modeled using a conditional logit model, which specifies the probability of choosing any option as a logistic function of observable utility $v_i(\cdot)$. For example, given a choice of plans A, B or N, the model specifies the probability of choosing a given plan A as:

$$Pr(A) = \frac{e^{v_A(\cdot)}}{e^{v_B(\cdot)} + e^{v_N(\cdot)}}$$

where $v_i(\cdot)$ is the observable utility function defined above. This function translates attributes of the respondent or of the plans considered into relative effects on the likelihood that a respondent will choose a particular plan. In this case, $v_i(\cdot)$ is specified as:

$$v_i(\cdot) = \beta_0 (neither) + \beta_1(acres) + \beta_2(acres*access) + \beta_3(acres*food) + \beta_4(acres*livestock) + \beta_5(acres*st\_con) + \beta_6(acres*st\_pur) + \beta_7(acres*t\_pur) + \beta_8(acres*dev)$$

where variables are defined as:

neither binary (0,1) variable indicating "neither plan" (no preservation).

acres number of acres preserved.

access binary (0,1) variable indicating whether preserved parcel offers access for passive recreation (default is no access).

food binary (0,1) variable indicating whether preserved parcel is farmed for food or field crops (default is forest/nursery land).

livestock binary (0,1) variable indicating whether preserved parcel is farmed for livestock or dairy (default is forest/nursery land).

st_con binary (0,1) variable indicating whether preservation is accomplished through state preservation contracts or easements (default is town purchase).

st_pur binary (0,1) variable indicating whether preservation is accomplished through outright purchase by the state (default is town purchase).

t_con binary (0,1) variable indicating whether preservation is accomplished through outright purchase by the town (default is town purchase).

dev binary (0,1) variable indicating whether the preserved parcel is not likely to be developed within the next ten years if not preserved (default is that development is likely within ten years).

cost the annual cost to the household to obtain the preservation program, in mandatory taxes and fees.

The betas ($\beta_{0...}\beta_8$) represent parameters (or weights) to be estimated by the model. This specification of $v_i(\cdot)$ was chosen after tests of numerous model specifications, and provides the best statistical fit of the collected survey data. This model can predict the probability that a respondent will choose a given farmland preservation policy from a given set of alternatives, given information on the variables noted above.

Variations in the conditional logit model are run using statistical software. The resulting parameter estimates correspond to the contribution of each attribute to overall utility of individual respondents. The statistical software STATA was used to estimate the conditional logit model; estimated models and parameter results are found in **Appendix E** of this report. Willingness to pay estimates are directly calculated from estimated model parameters, using the approach of Hanemann (1984).

To capitalize willingness to pay estimates so that the lifetime values could be obtained, the discounted present value for each of the 48 preservation options was obtained. The present value is the sum of all the expected yearly values generated over time. Reporting a total discounted present value for each acre of preserved follows the same method that would be used in assessing the market value of the flow of revenues provided by a business or working farm. The total present value is defined as:

$$\sum_t \frac{WTP}{(1+r)^t} \quad ; \text{t = 0, 1, 2, 3, ...}$$

where ***WTP*** is the willingness to pay estimate obtained from the original model as described above, ***r*** is the discount rate (in this case 6%), and ***t*** is the time over which the estimate is discounted. In this study, the total capitalized willingness to pay provided the discounted present value after 100 years. The capitalized present values are reported as overall willingness to pay per acre for the entire town over the lifetime of the parcels. These results are summarized in **Appendix D**.

Appendix B
Town Background and Demographics

Farm, forest and open space is an integral element of the New England heritage and rural tradition that characterizes the Quinebaug-Shetucket Heritage Corridor, in which the four towns in question (Brooklyn, Pomfret, Thompson, Woodstock) are situated. As pressures to convert farmland to developed uses continues throughout Connecticut, these towns face critical policy decisions related to the preservation of this character and heritage. According to Farm Census Data provided by the Farmland Information Center, the number of Connecticut farms (adjusted for 1997 economic and development densities) fell by roughly 15 percent in the five years from 1997 to 2002. Similar trends were reported for the total land utilized for agricultural production. A brief summary of these statistics are presented in Table 8.1.

Table 8.1. Connecticut Farm Census Data 1997-2002

	1997	*Adjusted 1997*	2002
Farms	3,687	4,905	4,191
Land in farms (acres)	359,313	406,222	357,154
Total land area (acres)	3,101,053	-	3,100,675
Full-time operators	1,824	2,228	2,077
Part-time operators	1,863	2,677	2,114
Percentage of operators 55 and older	51	-	49
Land managed by operators 55 and older (acres)	193,687	-	196,410
Market value of agricultural products sold ($1,000)	421,648	434,970	470,637
Percentage from crop production	63	63	70
Percentage from livestock production	37	37	30

(Farmland Information Center, 2006)

In addition to a decline in the number of active farms in Connecticut, the state has also experienced significant upward trends in the loss of prime soils to residential development and commercial uses. Following a 2002 assessment of data available on state land uses, the Center for Land Use Education and Research (CLEAR, 2002) reported the following changes in land use over the last 15 years in the state (Table 8.2).

Table 8.2. Connecticut Land Cover

	1985		1990		1995		2002	
	sq. miles	% of CT	sq. miles	% of CT	sq. miles	% of CT	sq. miles	% of CT
Developed	811	16.3%	874	17.6%	895	18.0%	930	18.7%
Turf & Grass	223	4.5%	221	4.5%	223	4.5%	223	4.5%
Other Grasses & Agriculture	553	11.1%	567	11.4%	580	11.7%	595	12.0%
Forest	2945	59.3%	2865	57.7%	2825	56.9%	2773	55.8%
Water	164	3.3%	164	3.3%	159	3.2%	151	3.0%
Wetlands	222	4.5%	220	4.4%	219	4.4%	221	4.5%
Other	51	1.0%	57	1.2%	68	1.4%	76	1.5%

(Center for Land Use Education and Research, 2002)

These trends are consistent throughout many Connecticut communities, including those examined in this study. Each of the four towns in this study has experienced similar changes in land use and overall rates of development, characterized by an increase in residential and commercial land uses and a decline in the total acreage of undeveloped lands, including farms. Many of the remaining active farms are adjacent to rapidly developing neighborhoods and commercial districts. As a result, farm owners face increasing pressure to sell or convert farmland to other uses. Since farmland is desirable for building because it tends to be flat, well drained, and affordable, farms are often purchased by developers for residential subdivision or commercial development. Table 8.3 summarizes development patterns within each of the four towns. As shown by the table, the rate of development has increased in each of these towns, at an average rate of roughly 1 to 2 percent every five years.

Table 8.3. Developed Land in Four Towns

	1985		1990		1995		2002		Change	
	acres	% of town	acres	% of town	acres	% of town	acres	% of town	acres	% change*
Brooklyn	1514	8.10%	1665	8.90%	1722	9.20%	1789	9.60%	275	18.20%
Pomfret	1650	6.30%	1728	6.60%	1752	6.70%	1807	6.90%	157	9.50%
Thompson	2879	9.20%	3152	10.10%	3247	10.40%	3399	10.90%	520	18.10%
Woodstock	2783	7.10%	2921	7.40%	2966	7.50%	3059	7.80%	276	9.90%

* as a percentage of the 1985 land cover area

(Center for Land Use Education and Research, 2002)

In light of housing and economic development pressures, these towns face new uncertainties regarding the most appropriate course(s) of action for preserving agricultural heritage and rural character. By quantifying the true local value of farms, forests, and open space to residents, policy makers can focus efforts and programs on areas that are most highly valued, and are hence most likely to garner local support.

Brooklyn

The Town of Brooklyn comprises a total of 18,697 land acres. Of this area, approximately 1,789 acres are considered developed for either residential or commercial use. The remaining acreage in Brooklyn is made up of farms and natural areas.

Brooklyn is noted for its New England village architecture and rural character. The town's recreational walking trails and restored historic monuments overlook many acres of active farmland, attracting visitors throughout the year. Existing agricultural lands remain in production for goods such as maple syrup, Christmas trees, and hand-crafted goods from local artisans. Despite economic pressure from adjoining commercial areas, these agricultural areas have persisted; employing over 3% of the town's population (U.S. Census Bureau, 2000). In the last twenty years, markets have increased development pressures on undeveloped lands. Developed land has increased since 1985; rising from about 8.1 percent to 9.6 percent of the total land area In Brooklyn (CLEAR, 2002).

Pomfret

The Town of Pomfret consists of 26,005 land acres, of which 1,807 acres are in residential and commercial use. With about 3,836 residents, Pomfret remains a sparsely-populated rural town (U.S. Census Bureau, 2000). Once primarily agricultural, Pomfret has evolved due to growing residential pressures and the introduction of light industry. Today, only 14 farms continue regular operation.

Over a twenty year period, developed areas have expanded to roughly 6.9 percent of the

town's lands (CLEAR, 2002). As a result of these pressures, Pomfret has initiated many land preservation actions. Although much of the open lands have resulted from the protection of the Mashamoquet State Park, several other tracts of land are supported with the aid from the Connecticut Audubon Society, the Windham Land Trust, and the Connecticut Department of Environmental Protection. In addition to these existing open tracts, the Pomfret continues to explore options to preserve its traditional agricultural lands.

Thompson

The Town of Thompson has an area of 31,248 total land acres. Today, 3,399 of these acres are developed for residential and commercial uses, while approximately 3,500 acres are maintained in agricultural production (CLEAR, 2002). Located in the northeast corner of Connecticut, the town of Thompson is bisected by several walking trails, including the Old Connecticut Path, the Middle Post Road and several railroad lines. Residents of Thompson have access to several recreational sites and activities. For example, the town offers numerous recreational sites for fishing, hiking, and boating.

Thompson is a part of the Quinebaug Shetucket National Heritage Corridor. Being a historically active farming community, the presence of agricultural production persists in the town today. Increasing pressures for residential development in the area have led to a decline in arable land within Thompson. While still important to the town landscape, agricultural land is receding. The area covered by development has increased since 1985; rising from about 9.2 percent to 10.9 percent of the total land area in 2002 (CLEAR, 2002). Some efforts have helped maintain larger family farms as accessible recreational lands. One such example is Quaddick State Park – once an old town farm, this site has since been converted to a popular outing and recreational destination.

Woodstock

As the second largest town in Connecticut by land area, Woodstock comprises 39,435 acres and is home to a growing population of approximately 7,800 residents (U.S. Census Bureau, 2000). While primarily rural and agricultural, the Town has supported several initiatives to preserve valuable farmland and open space within its borders. Woodstock's agricultural community consists of approximately 45 farms; with more operating dairy farms than any other community in the state (Woodstock Conservation Commission, 2003). Although several families have ceased to farm their original lands, many of these landowners continue to lease fields to farmers. Much of the land in agricultural use is devoted as pasture and Christmas tree farming.

Woodstock residents have pressed forward with Right to Farm and land preservation ordinances. Like many other towns in this northeastern region, economic developments and increased populations have driven several acres of active farmland into residential and commercial developments. Since 1985, developed areas have expanded to roughly 9.9% percent of the town's lands (CLEAR, 2002). Despite these changes, Woodstock has initiated many land preservation actions. The Woodstock Land Preservation and Land Acquisition Fund is just one example of the policy-born initiatives in which residents have attempted to protect the town's remaining farm heritage.

Town Demographics

The following section provides detail on the demographics of each of the four towns, as reported by the 2000 U.S. Census. As noted above, the four towns are largely rural. Industrial and commercial presence consists mainly of light industry and small commercial development areas. As indicated by Table 8.4 below, populations are generally small, ranging from just under 4,000 in Pomfret to over 8,800 in Thompson.

Table 8.4. Housing Demographics in Four Towns

	Brooklyn	Pomfret	Thompson	Woodstock
Total Population	7173	3798	8878	7221
No. of Housing Units	2708	1503	3710	3044
Avg. household size	2.59	2.64	2.55	2.62
Land Area (Sq Miles)	28.97	40.3	46.94	60.54
Land Area (Acres)	18,540.80	25,792.00	30,041.60	38,745.60
Density / mi^2				
Population	247.6	94.2	189.1	119.3
Housing	97.3	37.3	79	50.3

(U.S. Census Bureau, 2000)

Resident age distributions for each town are generally consistent with that of Connecticut as a whole.

Table 8.5. Age Distribution *(in percent)*

	Brooklyn	Pomfret	Thompson	Woodstock
Under 18 (years)	23.7	26.7	25	26.3
18-24	7.2	6.5	6.5	5.3
25-44	32.6	29.4	31.3	30.1
45-64	23.7	26.6	23.9	25.9
65+	12.9	10.8	13.3	12.4
Median	37.6	38.6	38.5	39.2
(Males to 100 females)	107.1	96.6	99.9	98.4

(U.S. Census Bureau, 2000)

Income distributions among the four towns are relatively close to the state median income level per household. The majority of residents in each town fall into a range from $25,000 to $75,000. Educational attainment, in contrast, shows a divergence between the relatively more educated towns of Pomfret and Woodstock and the relatively less educated towns of Brooklyn and Thompson.

Table 8.6. Income Distribution; State and Four Towns

	Connecticut	Brooklyn	Pomfret	Thompson	Woodstock
Median (Dollars)	53,935	49,756	57,937	46,065	37,458
	Income range (percents)				
less than $10,000	7	5.9	4.1	5.7	7.3
$10,000 - $14,999	5	6.9	4.2	7.3	5.8
$15,000-$24.999	9.7	11.2	9.4	13.8	15.7
$25,000-$34,999	10.1	10.6	8	9.8	15
$35,000-$49,999	14.4	15.5	13.7	18.1	21.3
$50,000-$74,999	20.4	22.3	28.4	23.3	22.5
$75,000-$99,999	13.3	15	13.9	13.8	6.5
$100,000-$149,999	11.7	9.7	12.2	5.8	2.1
$150,000-$199,999	3.7	2	4.5	1.9	1
$200,000+	4.7	0.7	1.6	0.5	2.7

(U.S. Census Bureau, 2000)

Table 8.7. Education Attainment - Comparison to National Distribution

.	U.S	Brooklyn	Pomfret	Thompson	Woodstock
Less than High School	19.6	21.1	9.3	19.8	8.3
High School or equivalent experience	28.6	32.1	32.7	37.8	29.9
One or more years of college	27.4	26.9	32.8	25	19.1
Bachelor's Degree	15.5	11.8	18.8	10.8	18.1
College Degree plus Graduate School	8.9	8.1	16.7	6.5	14.8

(U.S. Census Bureau, 2000)

Appendix C
Demographics of Survey Respondents

Demographic Comparison of Survey Respondents

In order to ensure that survey results and findings are comparable to the underlying populations of the four towns, it is important to consider the demographics of the survey respondents. One direct method for assessing the representativeness of survey results is to compare the demographics from each survey to those from the most recent U.S. Census data, for each town in the sample..

In addition to verifying that the survey responses represent town populations, this socio-economic information can also be used to quantify any significant differences in preferences or values among different groups within the population. For example, the average willingness to pay for an additional acre of preserved farmland may vary across income levels, as well as in comparison to the average willingness to pay in the town as a whole. It is, therefore, important to include socio-economic questions in addition to choice option questions in the survey to allow for such analyses.

The following provides a brief summary of the demographic results found in survey responses. From these tables, one may quickly compare demographic distributions across each of the four towns and note that, despite minor differences in spread, the four towns are comparable to one another.

Table 9.1. Survey Response: Average Household Size

Average Household Size			
Brooklyn	**Pomfret**	**Thompson**	**Woodstock**
2.82	2.77	2.61	2.68

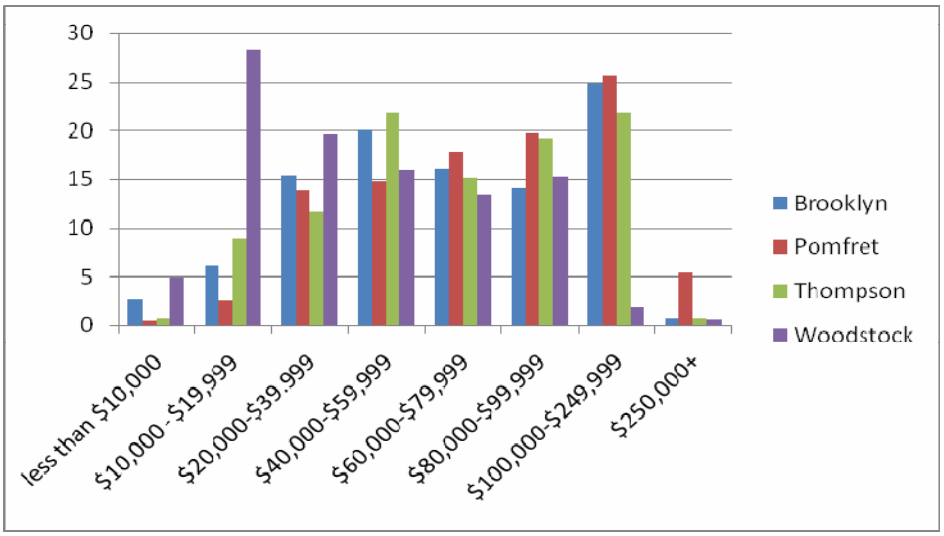
Table 9.2. Survey Response: Income Distribution *(in percent)*

Income Range	Brooklyn	Pomfret	Thompson	Woodstock
less than $10,000	2.7	0.5	0.7	4.9
$10,000 - $19,999	6.1	2.5	8.9	28.2
$20,000-$39.999	15.4	13.8	11.6	19.6
$40,000-$59,999	20.1	14.8	21.9	16
$60,000-$79,999	16.1	17.7	15.1	13.5
$80,000-$99,999	14.1	19.7	19.2	15.3
$100,000-$249,999	24.8	25.6	21.9	1.9
$250,000+	0.7	5.4	0.7	0.6

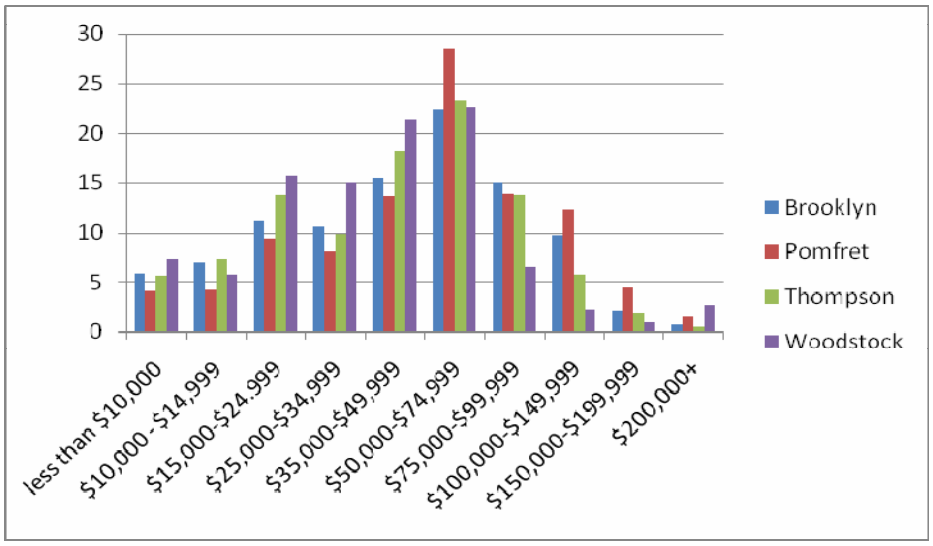
Demographic Comparisons – Survey and Census Data

In addition to comparability, it is also important to note that the demographic spread across towns is similar to U.S. Census data provided in 2000. As with many survey experiments, however, there demographic profiles are not identical. This is most notable with age and income distribution. Compared to census data, the sample of survey respondents has slightly more respondents in higher income and education brackets.

Figure 9.1 Income Distribution of Respondents and Population

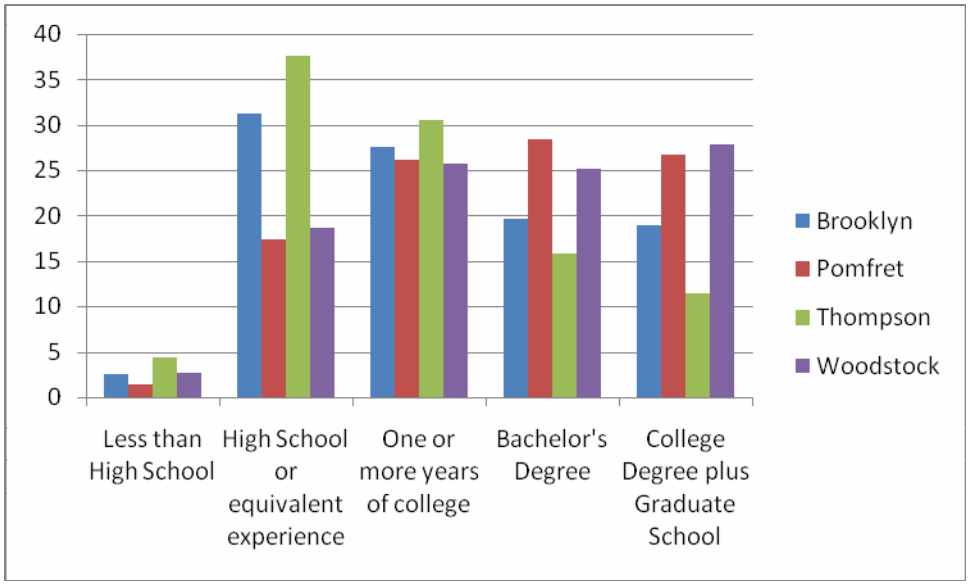


(Survey demographic distributions)

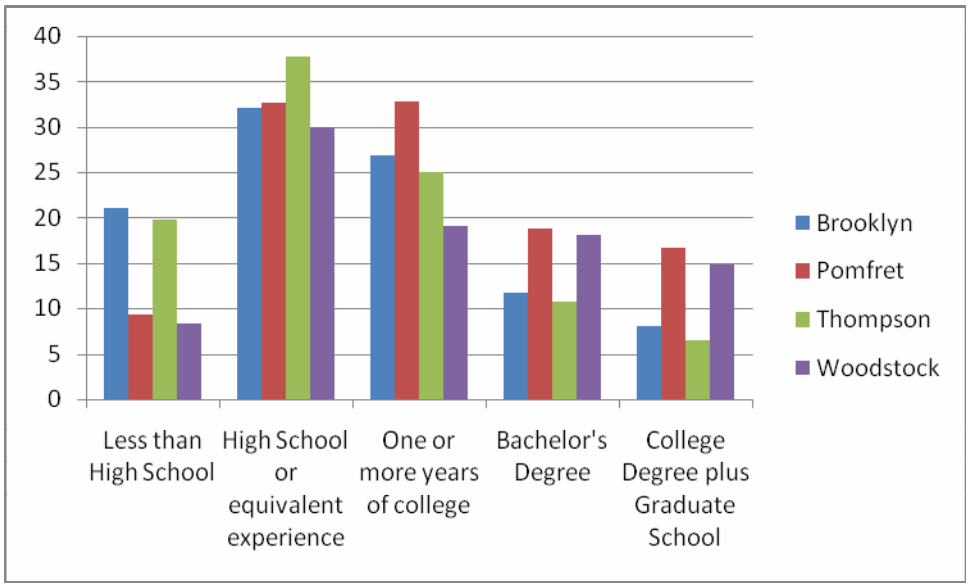


(US Census 2000)

Figure 9.2 Educational Attainment of Respondents and Population

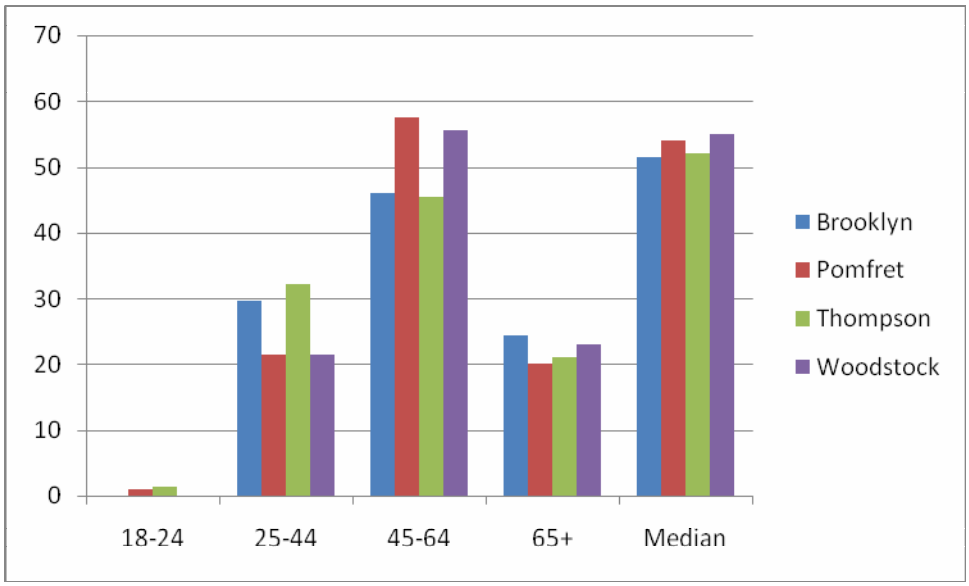


(Survey demographic distributions)

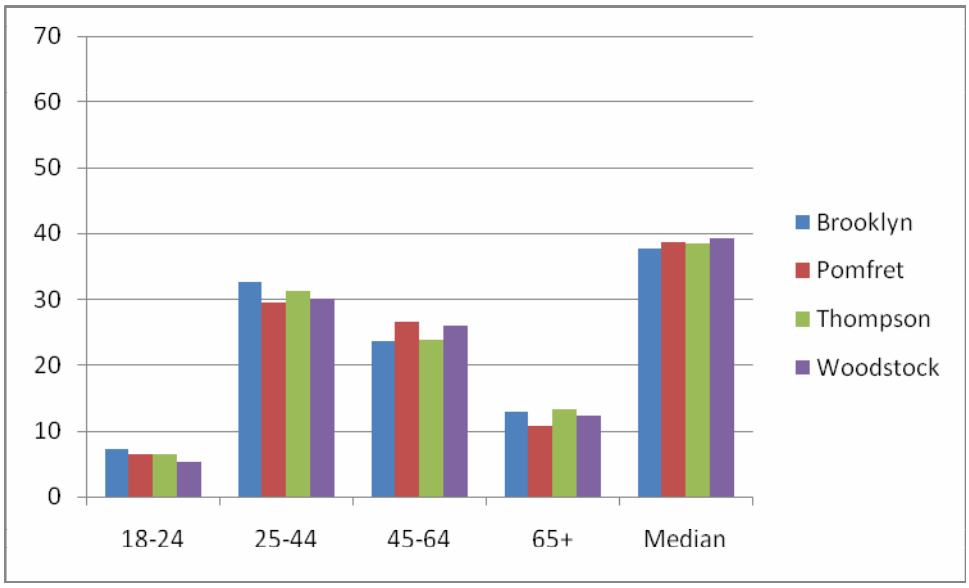


(US Census 2000)

Figure 9.3 Age Distribution of Respondents and Population



(Survey Demogrpahic Distributions)



(US Census 2000)

Appendix D
WTP Results

Table 10.1. Preservation Options: Detailed Characteristics

Preservation Option	Defining Characteristics
1	Forest/Orchard; Town Contracted Preservation; High Development Risk; No Access
2	Forest/Orchard; Town Contracted Preservation; Low Development Risk; No Access
3	Forest/Orchard; Town Contracted Preservation; High Development Risk; Access
4	Forest/Orchard; Town Contracted Preservation; Low Development Risk; Access
5	Forest/Orchard ; State Contracted Preservation; High Development Risk; No Access
6	Forest/Orchard ; State Contracted Preservation; Low Development Risk; No Access
7	Forest/Orchard ; State Contracted Preservation; High Development Risk; Access
8	Forest/Orchard ; State Contracted Preservation; Low Development Risk; Access
9	Forest/Orchard; State Purchase; High Development Risk; No Access
10	Forest/Orchard; State Purchase; Low Development Risk; No Access
11	Forest/Orchard; State Purchase; High Development Risk; Access
12	Forest/Orchard; State Purchase Low Development Risk; Access
13	Forest/Orchard; Town Purchase; High Development Risk; No Access
14	Forest/Orchard; Town Purchase; Low Development Risk; No Access
15	Forest/Orchard; Town Purchase; High Development Risk; Access
16	Forest/Orchard; Town Purchase; Low Development Risk; Access
17	Food/Field; Town Contracted Preservation; High Development Risk; No Access
18	Food/Field; Town Contracted Preservation; Low Development Risk; No Access
19	Food/Field; Town Contracted Preservation; High Development Risk; Access
20	Food/Field; Town Contracted Preservation; Low Development Risk; Access
21	Food/Field; State Contracted Preservation; High Development Risk; No Access
22	Food/Field; State Contracted Preservation; Low Development Risk; No Access
23	Food/Field; State Contracted Preservation; High Development Risk; Access
24	Food/Field; State Contracted Preservation; Low Development Risk; Access
25	Food/Field; State Purchase; High Development Risk; No Access
26	Food/Field; State Purchase; Low Development Risk; No Access
27	Food/Field; State Purchase; High Development Risk; Access
28	Food/Field; State Purchase Low Development Risk; Access
29	Food/Field; Town Purchase; High Development Risk; No Access
30	Food/Field; Town Purchase; Low Development Risk; No Access
31	Food/Field; Town Purchase; High Development Risk; Access
32	Food/Field; Town Purchase; Low Development Risk; Access
33	Livestock/Dairy; Town Contracted Preservation; High Development Risk; No Access
34	Livestock/Dairy; Town Contracted Preservation; Low Development Risk; No Access
35	Livestock/Dairy; Town Contracted Preservation; High Development Risk; Access
36	Livestock/Dairy; Town Contracted Preservation; Low Development Risk; Access
37	Livestock/Dairy; State Contracted Preservation; High Development Risk; No Access
38	Livestock/Dairy; State Contracted Preservation; Low Development Risk; No Access
39	Livestock/Dairy; State Contracted Preservation; High Development Risk; Access
40	Livestock/Dairy; State Contracted Preservation; Low Development Risk; Access
41	Livestock/Dairy; State Purchase; High Development Risk; No Access
42	Livestock/Dairy; State Purchase; Low Development Risk; No Access
43	Livestock/Dairy; State Purchase; High Development Risk; Access
44	Livestock/Dairy; State Purchase Low Development Risk; Access
45	Livestock/Dairy; Town Purchase; High Development Risk; No Access
46	Livestock/Dairy; Town Purchase; Low Development Risk; No Access
47	Livestock/Dairy; Town Purchase; High Development Risk; Access
48	Livestock/Dairy; Town Purchase; Low Development Risk; Access

Table 10.2. Average WTP (per acre, per household, per year)

	Independent	Joint
Woodstock	$0.3516	$0.3497
Brooklyn	$0.4032	$0.4032
Pomfret	$0.4938	$0.4928
Thompson	$0.2271	$0.2281

Table 10.3. Housing Units and Response Rates

	Number of Housing Units	Response Rates
Woodstock	3,044	0.4600
Brooklyn	2,708	0.4125
Pomfret	1,503	0.5525
Thompson	3,710	0.3975

Table 10.4. Average Total WTP per acre (Average WTP x Number of Housing Units x Response Rates)

	Independent	Joint
Woodstock	$492.38	$489.61
Brooklyn	$450.38	$450.39
Pomfret	$410.08	$409.21
Thompson	$334.98	$336.32

Table 10.5. Average Total Capitalized WTP per acre

	Independent	Joint
Woodstock	$8,238.94	$8,192.44
Brooklyn	$7,517.34	$7,517.50
Pomfret	$6,849.05	$6,834.46
Thompson	$5,584.37	$5,606.70

Table 10.6. Brooklyn: Model Results Comparisons

Preservation Options	Independent Model: Capitalized	Joint Model: Capitalized WTP
Average WTP	***$7,517.34***	***$7,517.50***
1	$4,895.52	$4,895.52
2	$1,229.02	$1,229.02
3	$19,372.29	$19,372.29
4	$15,666.50	$15,666.50
5	$0	$0
6	$0	$0
7	$12,413.96	$12,414.15
8	$8,727.00	$8,727.19
9	$0	$0
10	$0	$0
11	$14,063.49	$14,063.68
12	$10,372.06	$10,372.25
13	$0	$0
14	$0	$0
15	$11,891.44	$11,891.44
16	$8,205.90	$8,205.90
17	$5,397.77	$5,397.77
18	$1,729.89	$1,729.89
19	$19,879.91	$19,879.91
20	$16,172.75	$16,172.75
21	$0	$0
22	$0	$0
23	$12,919.00	$12,919.20
24	$9,230.68	$9,230.87
25	$143.31	$143.50
26	$0	$0
27	$14,569.15	$14,569.34
28	$10,876.35	$10,876.54
29	$0	$0
30	$0	$0
31	$12,396.29	$12,396.29
32	$8,709.38	$8,709.38
33	$10,862.15	$10,862.34
34	$7,179.41	$7,179.60
35	$25,402.61	$25,402.80
36	$21,680.58	$21,680.78
37	$3,947.13	$3,947.51
38	$283.21	$283.59
39	$18,413.75	$18,414.13
40	$14,710.55	$14,710.94
41	$5,586.38	$5,586.76
42	$1,917.99	$1,918.37
43	$20,070.53	$20,070.92
44	$16,362.86	$16,363.25
45	$3,427.87	$3,428.06
46	$0	$0
47	$17,888.93	$17,889.12
48	$14,187.15	$14,187.34

Table 10.7. Pomfret: Model Results Comparisons

Preservation Options	Independent Model: Capitalized	Joint Model: Capitalized WTP
Average WTP	***$6,849.05***	***$6,834.46***
1	$6,811.26	$6,577.96
2	$2,408.94	$2,328.90
3	$12,429.20	$12,178.25
4	$8,002.32	$7,905.56
5	$4,118.47	$3,898.13
6	$0	$0
7	$9,721.41	$9,483.53
8	$5,306.35	$5,222.19
9	$5,246.39	$5,039.45
10	$850.93	$796.90
11	$10,855.62	$10,631.20
12	$6,435.60	$6,365.02
13	$4,993.08	$4,812.36
14	$598.72	$570.77
15	$10,600.89	$10,402.84
16	$6,181.99	$6,137.63
17	$7,705.99	$7,611.19
18	$3,299.74	$3,357.75
19	$13,328.90	$13,217.21
20	$8,898.11	$8,940.15
21	$5,010.80	$4,928.60
22	$616.37	$686.52
23	$10,618.71	$10,519.74
24	$6,199.73	$6,254.03
25	$6,139.73	$6,071.10
26	$1,740.34	$1,824.18
27	$11,753.92	$11,668.58
28	$7,329.99	$7,398.03
29	$5,886.19	$5,843.77
30	$1,487.91	$1,597.81
31	$11,498.97	$11,439.98
32	$7,076.15	$7,170.40
33	$8,808.46	$8,819.77
34	$4,397.39	$4,561.23
35	$14,437.50	$14,432.49
36	$10,001.88	$10,150.32
37	$6,110.33	$6,133.97
38	$1,711.08	$1,886.78
39	$11,724.37	$11,731.79
40	$7,300.56	$7,460.98
41	$7,240.49	$7,277.83
42	$2,836.28	$3,025.81
43	$12,860.81	$12,882.00
44	$8,432.06	$8,606.35
45	$6,986.67	$7,050.23
46	$2,583.58	$2,799.17
47	$12,605.58	$12,653.14
48	$8,177.94	$8,378.45

Table 10.8. Thompson: Model Results Comparisons

Preservation Options	Independent Model: Capitalized	Joint Model: Capitalized WTP
Average WTP	***$5,584.37***	***$5,606.79***
1	$0	$0
2	$0	$0
3	$21,103.39	$21,195.28
4	$20,881.82	$20,949.42
5	$0	$0
6	$0	$0
7	$14,387.69	$14,780.16
8	$14,166.95	$14,535.17
9	$0	$0
10	$0	$0
11	$20,880.47	$21,274.07
12	$20,658.93	$21,028.20
13	$0	$0
14	$0	$0
15	$16,050.06	$16,773.47
16	$15,829.11	$16,528.21
17	$0	$0
18	$0	$0
19	$21,769.96	$21,195.28
20	$21,548.31	$20,949.42
21	$0	$0
22	$0	$0
23	$15,051.78	$14,780.16
24	$14,830.95	$14,535.17
25	$0	$0
26	$0	$0
27	$21,546.95	$21,274.07
28	$21,325.33	$21,028.20
29	$0	$0
30	$0	$0
31	$16,714.76	$16,773.47
32	$16,493.73	$16,528.21
33	$0	$0
34	$0	$0
35	$24,828.32	$24,566.39
36	$24,606.29	$24,320.07
37	$0	$0
38	$0	$0
39	$18,098.76	$18,139.29
40	$17,877.56	$17,893.84
41	$0	$0
42	$0	$0
43	$24,604.93	$24,645.33
44	$24,382.93	$24,399.00
45	$0	$0
46	$0	$0
47	$19,764.56	$20,136.33
48	$19,543.15	$19,890.61

Table 10.9. Woodstock: Model Results Comparisons

Preservation Options	Independent Model: Capitalized	Joint Model: Capitalized WTP
Average WTP	***$8,238.94***	***$8,192.44***
1	$2,223.71	$2,577.97
2	$0	$0
3	$25,466.13	$25,737.37
4	$12,927.87	$12,675.69
5	$0	$0
6	$0	$0
7	$22,410.77	$22,277.59
8	$9,894.69	$9,242.07
9	$4,552.80	$4,579.27
10	$0	$0
11	$27,827.02	$27,765.90
12	$15,271.66	$14,688.91
13	$0	$0
14	$0	$0
15	$20,897.83	$20,304.57
16	$8,392.75	$7,283.99
17	$1,196.00	$2,577.97
18	$0	$0
19	$24,424.37	$25,737.37
20	$11,893.67	$12,675.69
21	$0	$0
22	$0	$0
23	$21,370.85	$22,277.59
24	$8,862.32	$9,242.07
25	$3,523.68	$4,579.27
26	$0	$0
27	$26,783.85	$27,765.90
28	$14,236.04	$14,688.91
29	$0	$0
30	$0	$0
31	$19,858.82	$20,304.57
32	$7,361.29	$7,283.99
33	$9,175.45	$9,394.22
34	$0	$0
35	$32,512.67	$32,646.21
36	$19,923.43	$19,532.46
37	$6,148.93	$5,967.20
38	$0	$0
39	$29,444.93	$29,172.68
40	$16,877.86	$16,085.09
41	$11,514.09	$11,403.57
42	$0	$0
43	$34,883.13	$34,682.80
44	$22,276.78	$21,553.74
45	$4,650.29	$4,012.88
46	$0	$0
47	$27,925.85	$27,191.81
48	$15,369.77	$14,119.15

Appendix E
Raw Model Estimates

Conditional Logit Models: Results

Independant_Brooklyn Model:
clogit choice cost acres acr_access acr_food acr_lvstk acr_st_con acr_st_pur acr_t_pur acr_dev neither, group(q_id)

Output: note: 10 groups (30 obs) dropped due to all positive or all negative outcomes.

log likelihood = -628.17271

Conditional (fixed-effects) logistic regression Number of obs = 1950

LR chi2(10) = 171.85

Prob > chi2 = 0.0000

Log likelihood = -628.17271 **Pseudo R2** = 0.1203

Choice	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Cost	-.0097697	.0012057	-8.10	0.000	-.0121328	-.0074067
Acres	.0025677	.001693	1.52	0.129	-.0007506	.005886
Acr_access *(Acres*Access)*	.0075389	.0010846	6.95	0.000	.0054131	.0096646
acr_food *(Acres*Food/Fiber)*	.0002629	.0013129	0.20	0.841	-.0023104	.0028362
acr_lvstk *(Acres*Livestock/Dairy)*	.0031169	.0013443	2.32	0.020	.0004822	.0057517
acr_st_con *(Acres*State*	-.0036136	.001607	-2.25	0.025	-.0067632	.0003423
acr_st_pur *(Acres*State*	-.0027553	.0015804	-1.74	0.081	-.0058528	-.0008109
acr_t_pur *(Acres*Town*	-.0038857	.0015688	-2.48	0.013	-.0069604	.0001615
acr_dev *(Acres*Development*	-.0019222	.0010631	-1.81	0.071	-.0040059	.3830855
Neither	.1062298	.1412555	0.75	0.452	-.170626	.3830855

Independant_Pomfret Model:
clogit choice cost acres acr_access acr_food acr_lvstk acr_st_con acr_st_pur acr_t_pur acr_dev neither, group(q_id)

Output: note: 5 groups (15 obs) dropped due to all positive or all negative outcomes.

log likelihood = -860.95523

Conditional (fixed-effects) logistic regression Number of obs = 2637

LR chi2(10) = 209.45

Prob > chi2 = 0.0000

Log likelihood = -860.95523 **Pseudo R2** = 0.1084

Choice	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Cost	-.0102668	.0009917	-10.35	0.000	-.0122106	-.008323
Acres	.0050422	.0013579	3.71	0.000	.0023808	.0077035
Acr_access *(Acres*Access)*	.0041332	.0008344	4.95	0.000	.0024978	.0057686
acr_food *(Acres*Food/Fiber)*	.0006598	.0010768	0.61	0.540	-.0014507	.0027702
acr_lvstk *(Acres*Livestock/Dairy)*	.001472	.0010595	1.39	0.165	-.0006045	.0035485
acr_st_con *(Acres*State*	-.0019893	.0012303	-1.62	0.106	-.0044007	.0004221
acr_st_pur *(Acres*State*	-.0011554	.001274	-0.91	0.364	-.0036523	.0013415
acr_t_pur *(Acres*Town*	-.0013426	.0012499	-1.07	0.283	-.0037923	.0011071
acr_dev *(Acres*Development*	-.003255	.0008398	-3.88	0.000	-.0049011	-.001609
Neither	-.1680104	.1245442	-1.35	0.177	-.4121126	.0760918

Independant_Thompson Model:
clogit choice cost acres acr_access acr_food acr_lvstk acr_st_con acr_st_pur acr_t_pur acr_dev neither, group(q_id)

Output: note: 7 groups (21 obs) dropped due to all positive or all negative outcomes.

log likelihood = -611.4925

Conditional (fixed-effects) logistic regression Number of obs = 1887

LR chi2(10) = 159.07

Prob > chi2 = 0.0000

Log likelihood = -611.4925 **Pseudo R2** = 0.1151

Choice	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Cost	-.0073197	.0011234	-6.52	0.000	-.0095215	-.0051179
Acres	-.0019574	.0018865	-1.04	0.299	-.0056549	.0017401
Acr_access *(Acres*Access)*	.0082133	.0011686	7.03	0.000	.005923	.0105036
acr_food *(Acres*Food/Fiber)*	.0001964	.0014451	0.14	0.892	-.002636	.0030288
acr_lvstk *(Acres*Livestock/Dairy)*	.0010966	.0014497	0.76	0.449	-.0017446	.0039379
acr_st_con *(Acres*State*	-.0019828	.0016782	-1.18	0.237	-.0052721	.0013064
acr_st_pur *(Acres*State*	-.0000657	.0017094	-0.04	0.969	-.0034161	.0032846
acr_t_pur *(Acres*Town*	-.0014913	.0016598	-0.90	0.369	-.0047444	.0017619
acr_dev *(Acres*Development*	-.0000653	.0011488	-0.06	0.955	-.0023169	.0021863
Neither	.2711624	.1431221	1.89	0.058	-.0093517	.5516765

Independant_Woodstock Model:
clogit choice cost acres acr_access acr_food acr_lvstk acr_st_con acr_st_pur acr_t_pur acr_dev neither, group(q_id)

Output: note: 20 groups (60 obs) dropped due to all positive or all negative outcomes.

log likelihood = -740.59473

Conditional (fixed-effects) logistic regression Number of obs = 2148

LR chi2(10) = 92.02

Prob > chi2 = 0.0000

Log likelihood = -740.59473 **Pseudo R2** = 0.0585

Choice	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Cost	-.0056733	.00096	-5.91	0.000	-.0075548	-.0037918
Acres	.0005394	.0015447	0.35	0.727	-.0024882	.0035671
Acr_access *(Acres*Access)*	.0055959	.0009539	5.87	0.000	.0037262	.0074655
acr_food *(Acres*Food/Fiber)*	-.0002492	.001221	-0.20	0.838	-.0026424	.0021439
acr_lvstk *(Acres*Livestock/Dairy)*	.0016817	.0012139	1.39	0.166	-.0006974	.0040609
acr_st_con *(Acres*State*	-.0007313	.0013616	-0.54	0.591	-.0034001	.0019374
acr_st_pur *(Acres*State*	.0005642	.0014911	0.38	0.705	-.0023583	.0034867
acr_t_pur *(Acres*Town*	-.0010939	.0014412	-0.76	0.448	-.0039187	.0017309
acr_dev *(Acres*Development*	-.0030093	.0009617	-3.13	0.002	-.0048942	-.0011244
Neither	-.0866465	.132996	-0.65	0.515	-.3473139	.1740209

Joint_four_towns_(P>0.8) Model:

clogit choice cost acres acr_access acr_lvstk acr_st_con acr_st_pur acr_t_pur acr_dev neither cost_b acres_b acr_access_b acr_food_b acr_lvstk_b acr_st_con_b acr_st_pur_b acr_t_pur_b acr_dev_b neither_b cost_p acres_p acr_access_p acr_food_p acr_st_con_p acr_st_pur_p neither_p cost_t acres_t acr_access_t acr_lvstk_t acr_st_con_t acr_st_pur_t acr_dev_t neither_t, group(q_id)

Output: 42 groups (126 obs) dropped due to all positive or all negative outcomes.

log likelihood = -2841.3115

Conditional (fixed-effects) logistic regression Number of obs = 8622

LR chi2(34) = 632.20

Prob > chi2 = 0.0000

Log likelihood = -2841.3115 **Pseudo R2** = 0.1001

Choice	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
Cost (Woodstock)	-.0056845	.0009591	-5.93	0.000	-.0075643	-.0038046
Acres (Woodstock)	.0006265	.0012619	0.50	0.620	-.0018467	.0030996
Acr_access *(Acres*Access) (Woodstock)*	.0055859	.0009464	5.90	0.000	.003731	.0074408
acr_lvstk *(Acres*Livestock/Dairy) (Woodstock)*	.0016519	.0007413	2.23	0.026	.000199	.0031048
acr_st_con *(Acres*State Contracted)*	-.0008297	.0012301	-0.67	0.500	-.0032406	.0015812
acr_st_pur *(Acres*State Purchased) (Woodstock)*	.0004857	.0013806	0.35	0.725	-.0022203	.0031916
acr_t_pur *(Acres*Town Purchased) (Woodstock)*	-.0013036	.0008204	-1.59	0.112	-.0029115	.0003043
acr_dev *(Acres*Development Risk)*	-.0031411	.0006316	-4.97	0.000	-.0043791	-.0019031
Neither *(Woodstock)*	-.0877088	.1329431	-0.66	0.509	-.3482724	.1728548
cost_b (Brooklyn)	-.0040852	.0015406	-2.65	0.008	-.0071049	-.0010656
acres_b (Brooklyn)	.0019412	.0021116	0.92	0.358	-.0021974	.0060798
acr_access_b (Acres*Access) (Brooklyn)	.001953	.0014395	1.36	0.175	-.0008683	.0047742
acr_food_b (Acres*Food/Fiber) (Brooklyn)	.0002629	.0013129	0.20	0.841	-.0023104	.0028362

acr_lvstk_b (Acres*Livestock/Dairy) (Brooklyn)	.0014651	.0015351	0.95	0.340	-.0015437	.0044739
acr_st_con_b (Acres*State Contracted)	-.0027838	.0020237	-1.38	0.169	-.0067503	.0011826
acr_st_pur_b (Acres*State Purchased) (Brooklyn)	-.0032409	.0020985	-1.54	0.122	-.0073539	.0008721
acr_t_pur_b (Acres*Town Purchase) (Brooklyn)	-.0025821	.0017703	-1.46	0.145	-.0060519	.0008877
acr_dev_b (Acres*Development Risk)	.0012189	.0012366	0.99	0.324	-.0012049	.0036426
neither_b (Brooklyn)	.1939385	.1939767	1.00	0.317	-.1862489	.574126
cost_p (Pomfret)	-.0045788	.001377	-3.33	0.001	-.0072776	-.00188
acres_p (Pomfret)	.0042419	.00155	2.74	0.006	.0012041	.0072798
acr_access_p (Acres*Access) (Pomfret)	-.0014661	.0012581	-1.17	0.244	-.0039319	.0009996
acr_food_p (Acres*Food/Fiber) (Pomfret)	.0007618	.0009977	0.76	0.445	-.0011937	.0027173
acr_st_con_p (Acres*State Contracted)	-.0011498	.0015758	-0.73	0.466	-.0042384	.0019388
acr_st_pur_p (Acres*State Purchased) (Pomfret)	-.0016215	.001737	-0.93	0.351	-.0050259	.001783
neither_p (Pomfret)	-.0809991	.1819724	-0.45	0.656	-.4376585	.2756603
cost_t (Thompson)	-.0016294	.0014763	-1.10	0.270	-.0045228	.0012641
acres_t (Thompson)	-.0025709	.0019343	-1.33	0.184	-.0063622	.0012203
acr_access_t (Acres*Access) (Thompson)	.0026365	.0014994	1.76	0.079	-.0003023	.0055752
acr_lvstk_t (Acres*Livestock/Dairy) (Thompson)	-.0006602	.0014465	-0.46	0.648	-.0034953	.002175
acr_st_con_t (Acres*State Contracted)	-.0010626	.0018551	-0.57	0.567	-.0046985	.0025734
acr_st_pur_t (Acres*State Purchased) (Thompson)	-.0004625	.002	-0.23	0.817	-.0043823	.0034574
acr_dev_t Acres*Development Risk)	.0030687	.0013098	2.34	0.019	.0005015	.0056359
neither_t (Thompson)	.3594944	.1952934	1.84	0.066	-.0232735	.7422624

Appendix F
Statewide WTP Estimates

The local values reported in previous sections represent the willingness to pay *of local residents for preservation that occurs in their community*. For example, Thompson WTP values reflect the benefits, or local value, that Thompson residents derive from the preservation of undeveloped land in their town. It does **not** include additional values that residents of other Connecticut cities and towns hold for the preservation of farm and forest in Thompson. This is also true for Pomfret, Brooklyn and Woodstock WTP results. In most cases the local values described above can with a few adjustments be added to **statewide values** for land preservation to obtain total preservation values. Statewide values are described in greater detail in another report by the same authors.[11]

This appendix summarizes results of this prior statewide study, reporting on WTP findings from the *2005 Connecticut Land Preservation Survey*. This survey was a carefully designed choice experiment which assessed the amount that Connecticut residents would be willing to pay in taxes and associated fees to preserve farm or forest land *anywhere in Connecticut*. Results indicate that the total capitalized value of farm and forest preservation can be substantial, even when considering values of individuals who do not reside in the community where land is preserved.

As above, WTP can vary widely depending on the kind of land under consideration, the method used to prevent development, and the risk of future development on unpreserved parcels. When considering additional preservation in the range of 5,000 to 10,000 acres, the average statewide value per acre of preserved farm or forest in Connecticut is $6,595 per year, or $109,914 in total capitalized value. This value reflects the benefits that Connecticut residents derive from the preservation of undeveloped land anywhere in the state. Benefits of farmland preservation are composed mainly of residents' non-market values for amenities such as recreational access, scenic vistas, and community character. These values are not captured in prices paid for farm and forest land in market transactions. As a result, market prices underestimate the true value of farm and forest to Connecticut residents.

[11] Johnston, R.J., T.W. Campson and J.M. Duke. 2007. The Value of Farm and Forest Preservation in Connecticut. Technical Report, Department of Agricultural and Resource Economics, University of Connecticut.

Figure 12.1 Per Acre Preservation Value for Food/Dairy Farms and Idle Farmland: Connecticut Statewide Capitalized Values

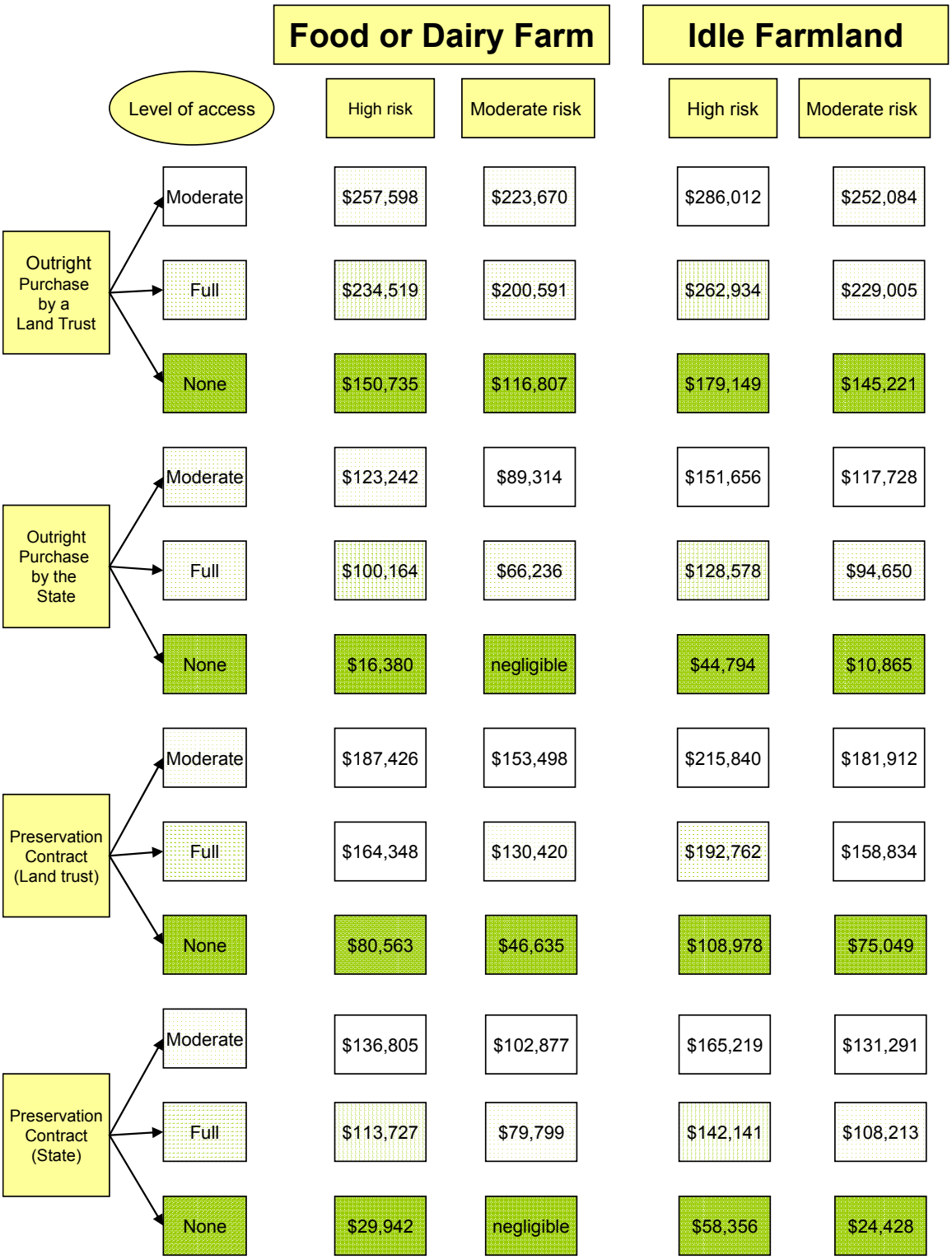


Figure 12.2 Per Acre Preservation Value for Forest and Nursery: Connecticut Statewide Capitalized Values

How can the dollar amounts in Figures F1 and F2 be used—in combination with town results from previous sections—to assess the total benefits and costs of open space preservation in any town? Consider the preservation of *food or dairy farms*, at a *high risk* of development, preserved via a *preservation contract* administered by the state, and providing *no access*. If these farms had been located in Thompson, the local willingness to pay to preserve these farms would have been **$0** per acre, as reported in Figure 6.5. This does not include additional values that residents elsewhere in the state would also hold for the same preservation activity – in this case, a total of **$153,598** per acre if one considers all state residents. So, in this case the total willingness to pay would be **$153,598** per acre (this is equal to **$0** + **$153,598**).

Note that the land types in the statewide survey summarized above are not always the same as those considered in the town surveys addressed in the main body of this report. Hence, in some cases the calculation of total (state + town) WTP may not be possible from these results.

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