AN ANALYSIS OF PARTICIPATION IN AND ECONOMIC IMPACTS OF

AGRITOURISM AND NATURE-BASED RURAL RECREATION

by

WESLEY CRAIG ZWIRN

(Under the Direction of John Bergstrom)

ABSTRACT

The main objectives of this study are to: asses factors that affect participation in agritourism and nature-based rural recreation and, determine the economic impacts that guide services for hunting, angling, and wildlife viewing may have on the economy of a 14-county region in Southwest Georgia.

INDEX WORDS: agritourism, nature-based rural recreation, IMPLAN

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DEDICATION

This thesis is dedicated to my wonderful wife, Jennifer, and my loving parents, Diane and Terry. Without the love and support of each of you over the past two and a half years, I would not be where I am today. I love you all very much, and I am forever in your debts. Thank you and I love you.

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CHAPTER I

INTRODUCTION

It is not a new phenomenon that farming is an extremely volatile business. As an industry that depends greatly on the weather, there are constant ups and downs not only in the daily working conditions but also in the prices farmers get for their commodities, and subsequently, their incomes. Even the advances in technology that farmers have taken advantage of can do little to ease the uncertainty they endure day in and day out. Many of the people who work in this industry, over time, have grown tired of the day to day trials that face them forcing many of them to look at other options besides farming.

Rural landowners, farmers, as well as experts in the recreation and tourism fields have found that there is a large and ever growing market for agritourism and nature-based rural recreation (Leones, 1995). Many farmers and rural landowners have changed their farming operation, or are thinking about doing so, in order to cater to this market. Because agritourism and nature-based rural recreation are relatively new industries, however, there are many things that can still be learned about it. It is the goal of this thesis to assess the factors that affect participation in agritourism and nature-based rural recreation as well as to estimate the economic impacts that guide services for hunting, angling, and wildlife viewing may have on a local economy (Thigpen, Ramsey, and Stribling, 2000).

Agritourism is defined as any business directly related to agriculture that is conducted by a landowner for the enjoyment or education of the public, to promote the products of the land and to generate additional income. Agritourism takes place in many

forms: educational tours, tasting events, agricultural museums, county fairs, commodity festivals, trail rides, camping, pick-your-own farms, and other agricultural related events that give consumers and producers an opportunity to "generate a meaningful exchange of values" (Jolly, 2001).

Nature-based rural recreation is defined as any recreational opportunity that is either conducted by a rural landowner or simply conducted on rural land that brings outside individuals onto rural lands to take place in recreation in order to promote wildlife, the environment, as well as to generate income for the landowner. Nature-based rural recreation, like agritourism, takes place in many forms including: bed and breakfasts, guided hunts, angling, park services, wildlife viewing (such as bird watching), trail riding, dude ranches, hiking, boating, petting farms, canoeing / kayaking, and others.

The difference between agritourism and nature-based rural recreation is that nature-based rural recreation is not directly dependent upon agriculture. Also, for the sake of this thesis, nature-based rural recreation is thought of as a more "active" participation in the activity. That is, nature-based rural recreation is thought of as being closer to a sport than the activities under the title of agritourism.

WHY MANY FARMERS WANT TO GET OUT OF FARMING AND INTO RECREATION AND TOURISM

Many farmers enjoy everything about the farming lifestyle except the volatility of farming itself. They enjoy the land, they enjoy their distance from neighbors, they enjoy waking up early, they enjoy going into town, they enjoy the sights and smells of nature, and overall, they enjoy the lifestyle. However, more than three-fourths of the 1978 traditional farms had left business by 1997 (Heimlich and Anderson, 2001). This shows

that even though many farmers enjoy their lifestyle they may not love farming and they are certainly not opposed to another career.

The majority of farms are very small, have low incomes, and have little influence on the entire market. These same small farms, however, own 69 percent of total farm assets, which is a substantial amount (Hoppe, 2001). It has been found that small farms have an extremely high debt to asset ratio making it very tough for them to stay in business while larger farms have an easier time. The fact that most farms are small and have a low income but have a large amount invested in them makes it very difficult financially for farmers to simply walk away from their land. Like any businessman that is not reaping the rewards from the work they are putting into their business, farmers and rural landowners have started asking themselves what else they could do to earn themselves a larger, less volatile income while at the same time let them continue to live on their land and live the rural lifestyle that they hold dear (Thigpen, 2000).

With their lifestyle and business in mind, farmers and rural landowners have begun focusing on ways to incorporate their largest asset into their prospective industry: their land. They have also begun to realize that a more consumer-focused approach that responds quickly and directly to a new, emerging set of interests, needs, and demands by consumers is critical in the success in this new industry (Jolly, 2001). This is where agritourism and nature-based rural recreation emerged onto the scene (Bayless, Bergstrom, Messonnier, and Cordell, 1994).

As much literature has presented, a changing set of demographics in America's society has been a major cause of society's new set of interests and demands (Jolly, 1999). As the mean age of the population continues to rise, as education increases, as the

"stay at home" mothers continue to take career jobs, and as the majority of America's population becomes more ethnically diverse, the interests and demands in recreation and tourism is differing from what they once were. "Serving diverse populations is a challenging task for resource managers because these relatively new customers bring their own perceptions, values, attitudes, and interpretations regarding natural resources" (Chavez, 1997). Becoming familiar with these changing demographics, landowners, business owners, and government officials can begin to cater to the new demands placed on recreation and tourism. For example, one study found that the average age of white recreation participants dropped between 1992 and 1997 (from 37 years old to 35.3 years old) while the average age of Hispanic participants increased from 1992 to 1997 (from 29.8 to 32.4). This same study found that the average number of years of education increased for whites over this same time period from 13.8 years to 14.7 years and the average number of years of education decreased for Hispanics from 11.2 years to 10.5 years (Chavez, 1997). These small changes affect recreation and tourism and they are but a few of the changes in the demographics of participants in tourism and recreation (Cordell, Teasley, Super, 1997).

Another change that certainly has affected the newfound demand for agritourism and/or nature-based rural recreation is "urban sprawl." Urban sprawl is when urban populations overgrow their bounds and actually start moving into the suburbs or surrounding rural areas. Urban sprawl is occurring in many major cities around the country. Amongst other problems associated with urban sprawl, one of the major problems relating to agritourism and nature-based rural recreation is that farmers and rural landowners are selling their land to developers who wish to build subdivisions and

strip malls. This is, financially, the most beneficial thing for the farmer and rural landowner but over time, as each landowner sells their land, agriculture and rural areas become less existent. This will lower the supply of land available for recreation and subsequently increase demand for agritourism and nature-based rural recreation at agritourism and nature-based rural recreation businesses.

The continual loss of land and agriculture from the American lifestyle over the past four to five decades has caused many "baby-boomers" to no longer have any ties with agriculture or the rural lifestyle. This applies even more so to the baby-boomer's children called "generation-X". Due to the large concentrations of people in urban areas, many people today have no connection with agriculture, which has led to a great demand for a service in the agritourism and nature-based rural recreation industry. This industry gives people opportunities to take part in activities in rural environments and rekindle their appreciation for the way the American lifestyle used to be.

THE MARKET FOR AGRITOURISM AND NATURE-BASED RURAL RECREATION

As stated earlier, agritourism and nature-based rural recreation are industries in Georgia with growing markets. In 1996, there were only four other states besides Georgia that reported having more retail sales, output, earnings, and jobs as a result of the hunting industry. The 1996 National Survey of Hunting, Angling, and Wildlife-Associated Recreation reports that wildlife-related recreation was a $ 2.8 billion dollar industry in Georgia that year with 1.6 million wildlife watchers, 1.1 million fisherman, and almost half a million hunters. These numbers are not unusual for other states, either.

These dollars were reported solely from expenditures on wildlife-related recreation and do not include the dollars that were spent outside the scope of that activity itself. These numbers do not include non-wildlife related recreation, such as camping, or any form of agritourism, such as bed and breakfasts. In Georgia, money spent in gas driving to the tourists' destination, the money spent on food and beverages, the money spent on lodging, and the money spent on entertainment for all other forms of agritourism and nature–based rural recreation may be added to the $2.8 billion in wildlife-related recreation when reporting profits for the entire market. So, while the rough wildlife-related expenditure total is estimated to be large, the total economic benefits from all forms of agritourism and nature-based rural recreation are estimated to be much larger (Golden Triangle RC&D, 1999).

A noteworthy point made in the 1996 survey that was described above stated "over 24 million Americans reported that they made nearly 267 million trips to watch birds and other wildlife, nearly 14 million hunters made 224 million trips, and 35 million anglers made over 506 million trips. Approximately 14%, 28%, and 13% of the total per capita expenditures are trip-related for wildlife viewing, angling, and hunting, respectively (Golden Triangle RC&D, 1999)." In other words, of the expenditures made by wildlife viewers, anglers, and hunters, 86%, 72%, and 87% of expenditures were spent *at* or *near* the destination on food and beverage, lodging, and entertainment and not on the activity itself. So, while the "main" activity people travel to take part in produces large financial benefits to an economy, the majority of the transactions result from all of the other activities people participate in other than the "main" activity itself.

These funds are going directly into the community's economy and are known as ***direct benefits***. Direct benefits are defined as the job and income creation to the host region resulting from the increased expenditures by tourists…(Eadington and Redman, 1991). As the direct benefit expenditures flow through the economy, secondary benefits are generated. Secondary benefits include "multiplier effects" caused by increased input supplier purchases down the supply chain and increased household expenditures on goods and services (IMPLAN PRO, 1997). The direct and secondary benefits of the money that is spent on agritourism and nature-based rural recreation will be focused on in chapter two of this thesis.

The main objectives of this thesis are to: 1) assess factors that affect participation in agritourism and nature-based rural recreation and 2) determine the economic impacts that guide services for hunting, angling, and wildlife viewing may have on the economy of a 14-county region in southwest Georgia. In assessing factors that affect participation in agritourism and nature-based rural recreation, this thesis will also estimate the number of days people participate in the activities classified under those titles. This will lead into the second objective of the thesis where per- day expenditures will be converted into an estimated thousand-day expenditure for economic impact measures. Ultimately, the estimated number of days of participation, estimated number of participants in the market area, and the thousand-day expenditures will be used to estimate the total economic impacts on the 14-county impact region in Southwest Georgia. These estimates will then determine how many total jobs, total generated labor income, total value added, and total output are created from outside expenditures spent on guide services for hunting, angling, and wildlife viewing in the 14-county impact region in southwest Georgia.

ORGANIZATION OF THESIS

The first chapter of this thesis describes farming and the hardships that farmers endure. It was also written to make a point of how there are many farmers and landowners that have given up on farming and are now looking into new endeavors such as tourism and recreation. This chapter gives readers a basic knowledge of what the terms "agritourism" and "nature-based rural recreation" mean as well as describes several activities that would fall under each respective category. It also describes the immense demand for the services of agritourism and nature-based rural recreation.

In the second chapter, the theoretical cross-sectional participation model used as well as each of the variables in that model will be summarized. The dependent variable will be defined as well as each of the independent variables and hypotheses will be made as to how it is believed each independent variable will affect the dependent variable.

Logit modeling procedures will also be explained. IMPLAN will then be introduced and a theoretical discussion of how it will be used in the thesis will follow. After an explanation of the theory behind IMPLAN modeling, direct, indirect, and induced effects on an economy will be described.

In the third chapter the background and methodology of the participation survey will be explained. The type of survey used and the response rates for the participation to analyze will be posed and a brief explanation of why they will be used will be included. Finally, the functional form of the participation model will be explained.

Figure 1. Map of Georgia with 14-County impact region in Southwest Georgia outlined and shaded

Table 1. List of southwest Georgia counties in the 14-County impact region

1.	Baker
2.	Calhoun
3.	Colquitt
4.	Decatur
5.	Dougherty
6.	Early
7.	Grady
8.	Lee
9.	Miller
10.	Mitchell
11.	Seminole
12.	Terrell
13.	Thomas
14.	Worth

Next, the economic impact survey background and methodology will be clarified. The explanation of IMPLAN from chapter two will be taken one step further in order to describe how IMPLAN was used to determine the economic impacts of nature-based rural recreation and agritourism. Finally, expenditures that were entered into the IMPLAN model will be presented along with how they were obtained.

The fourth chapter will present the results from the participation model as well as the IMPLAN model an explanation how these results were implemented to complete the two main objectives of this thesis will be presented. The output from the participation model as well as the IMPLAN model will then be used to determine the economic impacts that guide services for hunting, angling, and wildlife viewing could potentially have on the 14-county impact region in Southwest Georgia.

The fifth chapter will bring this thesis to a conclusion. A summary will be discussed as well as policy implications, difficulties with this thesis, future research needs, and parting notes.

CHAPTER II

THEORETICAL BACKGROUND

In this chapter, the theoretical cross-sectional participation model used, as well as each of the variables in that model, will be explained. The dependent variable will be defined as well as each of the independent variables and hypotheses will be made as to how it is believed each independent variable will affect the dependent variable. Logit modeling procedures will also be described. IMPLAN will then be introduced and a theoretical discussion of how it was used in the thesis will follow. After an explanation of the theory behind IMPLAN modeling, direct, indirect, and induced effects on an economy will be described.

The participation model was constructed to determine the factors affecting participation in agritourism and nature-based rural recreation. The participation model in this thesis is ***cross-sectional model***. This means that the survey used to provide data for the model surveyed respondents over a large territory, however, each respondent was surveyed at (or near) the same time. The opposite of a cross-sectional model is called a ***time-series model***. A time-series model collects data over time. Time series data are usually collected over the course of several years, whereas cross-sectional data are collected over the course of no more than several months. The participation model is a single-equation model, which means there is a single dependent variable, *Y,* and one or more independent variables, *X* (Gujarati, 635).

An ***independent variable*** is a variable that acts independently of all other variables. In other words, it is not affected by the presence of any other variables. A ***dependent variable***, on the other hand, is a variable that is affected by the presence of an independent variable. A dependent variable*, Y,* depends on independent variable(s)*, X*.

Going one step further, a simple participation model may be classified as a *linear regression model.* Linear regression models "deal with situations in which a dependent variable can be expressed in a model as a linear function of a single quantitative independent variable" (Ott, Chapter 9, 1993). A linear regression model is represented by the equation $\boldsymbol{Y = AX + B}$ (where *A* and *B* are the slope and intercept, respectively). If a reader were to use this equation to compute a table of values for X and Y, and then plot these figures on a graph, he would find that he had drawn a set of points which lie along a straight line; $Y = AX + B$ is therefore called a linear equation (James, 1995).[1] The participation model, however, has multiple independent variables and is therefore called a ***multivariate model***.

THE THEORETICAL PARTICIPATION MODEL

"Models used to assess recreation demand decisions can be grouped into three basic categories; site-specific user models, site-specific aggregate models, and population specific models" (Cicchetti, 1973). Population specific models rely on household-based surveys and are the most feasible of the three categories to retrieve data from (Bowker, 2001). This study uses a population specific model, as data is extremely difficult and

[1] "A function $Y = f(X)$ is said to be linear in X if X appears with a power or index of 1 only (that is, terms such as X^2, $\sqrt{X}$, and so on, are excluded) and is not multiplied or divided by any other variable" (Gujarati, 1995).

Table 2. Definition of independent variables included in the participation model for agritourism and nature-based rural recreation

VARIABLE NAME	DEFINITION
AGE	Survey respondent's age between 18 and 99 years old.
GENDER	Survey respondent's gender.
EDUCATION	Highest completed grade level of respondent including college graduate and higher education.
INCOME	Total household income of respondent.
POPULATION	Total population of respondent's hometown.
ETHNICITY	Respondent's ethnicity; white or non-white.

expensive to retrieve if using a site-specific model. The way the independent variables were selected for this participation model was by researching several previous recreational studies to determine the variables that were most often used in those studies. The best independent variables that data was available on were then used in order to determine the factors affecting participation as well as participation rates for this thesis. The study that works to accomplish the objectives that most resembles the objectives of this thesis is reported in the book titled "Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends" (Bowker, English, Cordell, 1999). Due to its comparability, this was the model that was used most as a reference for this thesis' participation model.

There were some variables that were used in previous studies that could not be used in this participation model simply because there were no *questions* in this survey that asked for that particular information. "Previous research has shown that the amount of outdoor recreation settings or opportunities available to an individual will affect the individual's choice and intensity of participation in given activities" (Bowker et al., 1999). Previous models use "distance from a recreation site" as an independent variable that will affect participation, however, this information was not available and was not included in the participation model (Greene, 1995). The theoretical participation model specified for this thesis was:

(1.) $\textbf{Participation}_{p} = f(A_p, G_p, E_p, I_p, P_h, E_p) + e$

where $Participation_p$ represents if the "participant" will participate in agritourism and rural recreation. A_p represents the age of the participant "p", G_p represents the gender of participant "p", E_p represents the education of participant "p", I_p represents the income of the household of participant "p", P_h represents the population of the hometown of participant "p", E_p represents the ethnicity of participant "p" (either white or non-white).

This function shows Participation as a function of the variables: Age, Gender, Education, Income, Population, Ethnicity, and the error term, E. Participation will be affected if these independent variables increase or decrease (the independent variables will change first, causing a change in the dependent variable, *Participation*). Using Gujarati's definition of linear, the participation model is linear because each of the variables, Age, Gender, Education, Income, Population, Ethnicity, and the error term E, are all raised to the power of 1. The reason that a multivariate demand model was used for this thesis was because of the straightforward nature of what was to be accomplished. This type of model is simple and easily understood which makes it attractive to use if possible.

For the participation model, many of the variables were converted into ***dichotomous variables***. This means that the responses to the questions would be coded as a 1 if the respondent answered "yes" and 0 if the respondent answered "no".[2] If questions were not "yes/no" questions, answers were designated to pre-assigned groups that were classified as 1's or O's. Once the responses were grouped into 1's or 0's they

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[2] The survey was not set up for binary responses (0 or 1) so responses were grouped into binary groups for the sake of this thesis. "It is not recommended to group information into binary groups as information may be lost or generalized", however, this is the best way to accomplish the objectives of this thesis using the data that was available (Demaris, 54).

were put into the *Logit* model. A **Logistic Regression** model (called ***Logit*** model for short) is a model that uses binary responses (0's or 1's) to predict the probability of an event occurring.

Once a logit model has been run, the output reports how many of the total people that were surveyed will participate (denoted by a 1), and how many of the total people that were surveyed will not participate (denoted by a 0). Logit models are frequently used in recreation, economics, political science, and various other fields where individuals provide *yes* or *no* responses to behavioral questions (Bowker et al, 1999).

Much like a linear regression model's R^2, which reports the goodness of fit of the fitted regression line to a set of data, a logit model reports a similar value called ***percent concordant***. Percent concordant is also a number taking on values between 0 and 1. Percent concordant reports a percentage that the value assigned to the event in question in a logit model (either a 0 if the event in study will not occur or a 1 if the event in study will occur) is correct. In other words, if a logit model assigns a 1 to an event predicting the event will occur and the percent concordant is 0.85, this would mean that statistically there is an 85 percent chance that the studied event will, in fact, occur. The same holds true if the assigned number was a 0 and the percent concordant was 0.85. This would mean that there is an 85 percent likelihood that the studied event will not occur. The closer the percent concordant gets to 1, the stronger the model. If a percent concordant is reported to be .5, this would mean that there is a fifty percent chance that the number assigned to the event being studied is correct and there is a fifty percent chance that the number assigned to the even being studied is incorrect. Fifty percent is obviously not a strong percent concordant.

PARTICIPATION MODEL SPECIFICATION

In this model, ***Participation*** is the dependent variable, Y. This is the variable that is dependent upon all of the independent variables, X. The participation variable, after the model was run, is reported as a 0 or a 1. This number, as explained above, is the way a logit model reports if a person will participate (1), or if a person will not participate (0). Participation, in this thesis, is to be thought of in terms of consumer's participation, not producer's. In other words, it was assumed that there are already places for people who are interested in agritourism and nature-based rural recreation to recreate at and this model is simply determining if the respondents will, or will not, participate at those locations.

The independent variable ***Age*** is a demographic of each of the respondents of the survey. Respondents are between the ages of 18 and 99 years old. The hypothesis for age is that the older a participant is, the more likely they will participate in agritourism and nature-based rural recreation. This hypothesis was reached because it is believed that older people will have a stronger desire to be out in nature, which is more of a typical desire of someone who is mature. It is also believe that older people will have more time and more financial ability to recreate. For the participation model, each response was assigned the exact age that the respondent reported in their survey; from 18 – 99 years old.

The next independent variable is ***Gender.*** This variable is a dichotomous variable and is coded as a *0* for all respondents who are female and as a *1* for all respondents who are male. This variable is predicted to be largely positive, which means that if the respondent is a male it is highly likely that he will participate in agritourism and nature-

based rural recreation. This is assumed because it is believed that most males will find at least one of the many recreational events under the title "agritourism and nature-based rural recreation" to be of interest to him.

The next independent variable is ***Education***. This question is also coded as a dichotomous variable; *0* is coded if the respondent had an education level of up to but no higher than a graduate of high school, and *1* encompassed all respondents who had some college, up to and including, an advanced degree.

It is predicted that the more education a person has, the more likely it is that they will participate in agritourism and nature-based rural recreation. This is a hypothesis based on the belief that higher educated people will yearn for more aesthetic beauty and mental stimulation that nature can provide than a less educated person. It is also predicted that more educated people will have more time to participate in recreation activities than less educated people. For these reasons, it was hypothesized that higher educated people will be more likely to participate in recreation activities than less educated people.

The next independent variable is ***Income***. Income is the approximate total household income that the main one (if a single earning household) or two (if a double earning household) money earners make over the course of a year. Income was not set up as a dichotomous variable; in the survey, respondents were given several ranges of household incomes to choose from. The midpoint of the range was used to enter into the participation model rather than using the range. This was done in order to give one concrete household income rather than a range. Table 2 reports the ranges of incomes people surveyed chose from. Due to the open-ended nature of this range, a low point

Table 3. Ranges of household income the respondents chose from as well as the midpoints that were used in the participation model

Category	Range of Total Household Income	Midpoint Used in Participation Model
1.	$ 4,999 or Less	$ 2,499.50
2.	$ 5,000 - $ 9,999	$ 7,499.50
3.	$ 10,000 - $ 14,999	$ 12,499.50
4.	$ 15,000 - $ 19,999	$ 17,499.50
5.	$ 20,000 - $ 24,999	$ 22,499.50
6.	$ 25,000 - $ 29,999	$ 27,499.50
7.	$ 30,000 - $ 34,999	$ 32,499.50
8.	$ 35,000 - $ 49,999	$ 42,499.50
9.	$ 50,000 - $ 74,999	$ 62,499.50
10.	$ 75,000 or More	$ 75,000.00*

* Indicates that a low point of $75,000 is used rather than a midpoint as the range is open ended

of $75,000 was entered into the model if respondents chose the highest income range. This eliminates the problem of overstating the income, which can be a problem if low points are not used in open-ended questions.

It is believed that participation will correlate positively with income. This means that as the respondent's income goes up, so too will participation in tourism and recreation. This was hypothesized because economic theory explains that a person with a higher income will have more expendable income than a person with a lower income. This will allow people with a higher income more of an opportunity to be able to afford the costs of recreating.

The fifth independent variable is ***Population.*** This survey question, like income, asks respondents to pick between several different ranges of populations of their hometowns. In the survey, respondents have the option of picking the category that best represents the number of people who populate the town they lived in at the time the survey was conducted. Non- responses were not used in the model for this variable. A table showing the options survey respondents had to choose from to describe their hometown population is shown on Table 4.

It is expected that people from larger towns will participate in agritourism and nature-based rural recreation more than a respondent from a smaller town. This is hypothesized because it is logical for people who live in a large city or town to look forward to getting out of the large city into a smaller, more rural atmosphere.

The next independent variable was ***Ethnicity***. Again, responses were grouped into binary groups with a *0* denoting that the respondents are non -white and a *1* for respondents who are white. The reason this was coded this way was because other

Table 4. Ranges of populations the respondents chose from as well as the midpoints that were used in the Participation model

Category	Title	Range of Population on Survey	Midpoint Used for Participation Model
1.	Farm	1 – 500	251
2.	Rural, not farm	501 – 1,000	751
3.	Small Town	1,001 – 4,000	2,501
4.	Medium Town	4,001 – 10,000	7,001
5.	Large Town	10,001 – 25,000	17,501
6.	Medium –Size City	25,001 – 50,000	37,501
7.	Large City / Metro Area	50,001 or more	50,001*

* Indicates that a low point of 50,001 is used rather than a midpoint as the range is open ended

previous models grouped ethnicity responses this way. Another reason that it was done this way was because the two major groups that were surveyed were white and African - American. There were very few other ethnicities that were surveyed, therefore, all other ethnicities were aggregated together with the African American respondents and titled "Non –White".

The hypothesis for the ethnicity category was that it would have a positive correlation with participation. This means that if the respondent is white, they would be more likely to participate in agritourism and nature-based rural recreation. Previous research has shown that agritourism and nature-based rural recreation activities (such as hiking, horseback touring, and shooting range) has a predominantly white following, whereas, there is a more diverse following for less traditional recreational activities (such as bungee jumping, heli-skiing, and hang gliding) (Chavez, 1997). Because of this fact, it is believed that ethnicity will have a positive correlation with participation.

The term **E** is an error term that allows for inexact relationships between economic variables. This term represents factors that affect participation but are not taken into account explicitly (Gujarati 1995).

ECONOMIC IMPACTS OF HUNTING, WILDLIFE VIEWING, AND ANGLING

IMPLAN is a computer modeling system that is able to evaluate the economic impacts of tourism on an economy in terms of changes in industrial output, employment, income, and taxes (Department of Community Development University of Vermont, 1999). "The full title of the computer system, "IMpact analysis for PLANning", indicates its original intent" (Propst, 1990). The type of data that is produced by IMPLAN is often

called “input-output” data, which refers to how money is put into an economy (input) and how that money generates new goods and services for that economy (output).

Input-Output modeling produces models that show the interactions among sectors in an economy and measures the impacts they create as they “ripple” through the economy (Dept. of Community Development Vermont, 1999). This type of model not only shows the direct effects of tourist’s expenditures but also captures the indirect and induced effects that occur as their money moves throughout the economy. This is important when determining how different sectors of the economy affect each other. By knowing this type of information, government officials and / or potential or existing private business owners can determine how dependent their industry (or a proposed industry) is on others or vice-versa. This information can also be used to help determine how successful a business, or industry, could become. Although input-output modeling can be used to determine how successful a private business could become, it is the intent of this thesis to use IMPLAN to show how incoming monies affect the entire economy of the 14-county region in Southwest Georgia and not focus on one specific business.

Direct effects represent the impacts (e.g. change in employment) for the expenditures and/or production values specified as direct final demand changes (IMPLAN PRO Guide, 1997). In other words, direct effects are the first-round effects of the money that is spent in an economy

Indirect effects are the effects that occur to the economy as the industry that was directly affected spends money inside the local economy. Using the recreation visitation example, direct effects are the results of money spent by a guest at a hotel. Newly created jobs and services that the hotel provides are direct impacts. The hotel then

buys inputs from other regional businesses, such as office supplies and linens, which are indirect effects. Workers from the hotel and other complimentary businesses in the economy, whose jobs are supported by the hotel, then make personal consumption expenditures to grocery stores, restaurants and movies, which are called induced effects.

Input-Output effects can be calculated for areas as large as entire countries or as small as areas within one zip code. Interest in regional economic development has been growing over the past two decades. Rural governments, for reasons discussed in chapter one, have been trying to determine feasible ways for rural landowners and farmers to diversify their operations in order to have alternate income opportunities other than farming. Adding operations other than farming into the community diversifies the economy causing more stability when commodity prices are low or weather is unfavorable. Also, studying the effects of how money is spent within the economy and how services are generated will greatly help with the problem of poverty and underdevelopment in rural areas (Bergstrom and others, 1990). For this thesis, a 14 county region in Southwest Georgia will be focused on to determine the effects of money being spent within this region.[3]

Expenditures associated with hunting, angling, and wildlife viewing will be examined. These expenditures will then be expanded to determine expenditures on a thousand-day basis. This will allow private business owners, prospective business owners, and governments to look at expenditures on an easily adjustable basis instead of expenditures on a per day or per season basis. These numbers can easily be adjusted by

[3] The Golden Triangle Resource Conservation and Development Council of Georgia specified these 14 Southwest Georgia counties. The Golden Triangle RC&D Council is a council that promotes Eco-tourism by connecting outdoor enthusiasts to landowners, outfitters and guides. It's main goal is to promote outdoor activities in order to create jobs and provide alternative income for local residents.

business owners in order for them to use their own specific expenditure expectations. This will be beneficial to them if they would like to know, for example, how many days it will take in order to reach a certain revenue or how long it will take to be able to cover all of their overhead costs. It will then be determined how the money that is spent on transportation to recreation destinations, food, lodging, equipment rental, equipment purchases, and other purchases intended for the use of participating in recreation, affect our impact region in terms of direct, indirect, and induced effects.

CHAPTER III

EMPIRICAL METHODOLOGY

In this chapter, the background and methodology of the participation survey will be explained. The type of survey used and the response rates for the participation model will also be explained. The benefits of this type of survey, the problems associated with it, as well as weighting procedures will also be clarified. Next, the questions from the participation survey that were focused on in order to obtain data to analyze will be posed and a brief explanation of why they will be used will be included. Finally, the functional form of the participation model will be explained.

The economic impact survey background and methodology will then be clarified. The explanation of IMPLAN from chapter one will be taken one step further and a description of how it was used to determine the economic impacts of rural nature-based rural recreation and tourism will be explained. Finally, expenditures that were entered into the IMPLAN model will be presented along with how they were obtained.

MARKET RESEARCH

When a marketer needs information concerning the public's attitude, perception, or experiences on a particular idea or product, the information is often collected by means of a survey. Survey research is the use of a questionnaire to gather facts, opinions, and attitudes (Aldrich, 1998). Surveys are an extremely popular way to gather primary data for marketers, because surveys can be constructed to: get answers as to why people act a

certain way given a certain situation, determine what people think about a particular product or idea, understand how the public makes decisions, as well as determine the demographics of the people who make up the market that the product or idea is trying to reach. There are pros and cons to survey research but it is difficult to dispute the usefulness of the information that surveys have given market researchers. Surveys yield invaluable information about the public in an extremely timely and efficient manner.

THE PARTICIPATION SURVEY BACKGROUND AND METHODOLOGY

Researchers in the University of Georgia's College of Agricultural and Environmental Sciences constructed the questions for the survey that was used for this thesis. The survey was then given to the Survey Research Center (SRC) at the University where their staff put together a group of interviewers to carry out the survey. The survey was intended to assess Georgia residents' interest in agricultural tourism and knowledge of environmental issues related to agriculture. Before the survey was conducted the interviewers that were to conduct the survey attended two-three hour training sessions that covered survey methods, standard procedures of telephone interviewing, the purpose of the survey, and in-depth explanation of the survey instrument, and a practice session (SRC, Ag. Tourism and Environmental Survey Methods and Procedures). These steps were taken in order to minimize errors that could occur and to ensure accuracy of the survey and of the responses given. Survey errors are extremely costly to marketers as they may ultimately foul up the accuracy of the data the marketers are trying to gain. Particular survey errors and strategies on how to minimize them will be discussed later on in this chapter.

The participation survey was conducted over the telephone in January and February of 2001. A total of 858 randomly selected households were contacted. Of the 858 randomly selected households, 395 gave complete responses to the survey yielding a 46 percent response rate.

Telephone surveys are a very common type of survey when there is a large sample size and the sample is dispersed over a large area (as was the case for this thesis). Telephone surveys, however, are largely criticized for their inaccuracy. As much as they are criticized for their inaccuracy, however, they are praised for many other reasons. Central location telephone surveys have the ability to efficiently reach mass numbers of respondents in a timely manner, as well as to be monitored by supervisors. Being monitored by supervisors helps in correcting any problems that the interviewer may have with their computers, their phones, the wording of the questions, or any other unforeseen problems that may occur. This also ensures a more 'uniform' pattern of how the interview process is conducted. Other strengths of the phone survey are that interviewers can explain questions to the respondent if the respondent does not understand the question. Surveyors can also probe the respondent a little if their response does not completely answer the question.

A great weakness of the phone survey is that many families in America consider phone surveys a nuisance. Telemarketing has become a great burden on families due to the frequency and untimeliness of calls by telemarketers or tele-sales people. Because of this, the validity of data received by phone surveys is questioned. There are other problems involved with telephone surveys that cause data received by them to be questioned. Making sure that questions are answered truthfully is nearly impossible to

do, as is making sure that the interviewer does not word the questions in such a way that can influence the respondent's answers. Making sure that the sample that is surveyed represents a true proportion of the entire population is difficult and imperative, as is giving all households a near-equal chance of being selected for inclusion in the survey (SRC, Ag. Tourism and Environmental Survey Methods and Procedures).

If the sample represents a true proportion of the entire population then the chances of the data being *biased* will be greatly reduced. In other words, if one group (such as females) are surveyed and all other groups are left out of the survey, the data will not represent the opinions of the groups who were not surveyed. This data will then be *biased* because the females who were surveyed may not have the same opinions to the questions as the group that was not surveyed. In order to keep the data from being biased, the ratio of each demographic category of respondents in the survey (all races, both genders, each range of household income, each different level of education, and the rural to urban household location ratio) must equal the ratio of each of these categories across the entire population of the area in study. The survey asked questions to residents of the entire state of Georgia.

The very populated metro-Atlanta area seems like a logical and easy place to get most of the responses to the survey since there are so many people residing there. It is, however, very important to include in this survey the same ratio of people from the metro-Atlanta area as the ratio of people residing in non-metro counties. In other words, if the state of Georgia has 50 percent of the population residing in metro counties and the other 50 percent residing in non-metro counties, then for every one person surveyed from metro-Atlanta there needs to be one person surveyed from a non metro-Atlanta county.

If, for example, there were 2 people surveyed from metro-Atlanta to every one person surveyed from non metro-Atlanta counties then the data would not be accurate and steps would need to be taken to correct for this unproportional survey. This process is called ***weighting***.

When checking to make sure all groups were represented equally in this thesis it was determined that metro-Atlanta residents were actually underrepresented. This was interesting because usually non-metro counties are underrepresented in surveys because of the ease of contacting citizens in such concentrated urban areas. Using data collected by the U.S. Census Bureau it was found that metro-Atlanta citizens over the age of 18 totaled 3,013,989 and the total number of Georgia citizens over the age of eighteen was 6,017,043. This means that the ratio of metro-Atlanta citizens over the age of eighteen was **50.09 percent**. (The reason information was only reported for citizens over the age of eighteen was because surveyors only surveyed respondents over the age of eighteen.)

Comparing these numbers to the participation survey responses, it was found that the number of metro-Atlanta residents surveyed was 166 out of a total of 395 responses. This shows that the ratio of metro-Atlanta respondents over the age of eighteen was **42.02 percent**. Because the ratio of *total* metro-Atlanta residents over eighteen is 50.09 percent and only 42.02 percent of the survey was from metro-Atlanta, this shows that a true proportion of metro-Atlanta citizens were not surveyed (they were underrepresented). Because metro-Atlanta citizens were underrepresented, this means that non metro-Atlanta citizens were over-represented. The under-representation of metro-Atlanta citizens was corrected by weighting, or adding “power” or “weight” to the responses given from them.

Weighting adds "weight" to under-represented samples. This process adds "weight" to under-represented samples in order to make the data that they provide as powerful as the over-represented sample. By making the weight of the under-represented sample data more powerful than the over-represented sample, this will equal the amount of influence both samples' data has on the statistical tests that will be performed with the overall data.

By assigning all data received by non metro-Atlanta county respondents a weight of 1, this keeps the data they gave from gaining or losing any "power" in statistical tests. After non metro-Atlanta counties were weighted with a 1 a number was needed to weight all the data received by metro-Atlanta respondents. The way this number was determined was by arbitrarily picking a number greater than one, that when multiplied to the metro-Atlanta respondents and run on the SAS computer program, yielded a mean of 0.50 or 50 percent. The reason a mean of 50 percent was needed was because the ratio of metro-Atlanta citizens over the age of 18 to the total Georgia citizens over the age of 18 was 50.09 percent (U.S. Census, 2002). The number that was determined to give this effect was 1.40. This shows that the data received by metro-Atlanta respondents needed to be weighted by 1.40 in order for it to have the same power, or influence, as the data received by non metro-Atlanta respondents. Once this was determined, all data from non metro-Atlanta citizens were assigned a weight of 1, and all data from metro-Atlanta citizens were assigned a weight of 1.40. Now, metro-Atlanta responses were as powerful as non metro-Atlanta responses even though the ratio of people that were surveyed did not truly represent the correct proportions of the state of Georgia.

Once the weighting needed for the survey responses was determined the participation model was ready to be estimated. Using four survey questions, data needed to determine the factors that affect participation in agritourism and nature-based rural recreation were obtained which made it possible to estimate the economic impacts that hunting, angling, and wildlife viewing could potentially have on the 14-county impact region in Southwest Georgia.

The four questions that were focused on were:

1. Have you or members of your household ever gone on an outing to pick fruit or vegetables, sightsee, see farm animals, or otherwise take advantage of a farm environment for recreation and leisure?

2. Would you say it is very likely, somewhat likely, not very likely, or not at all likely that you or your family might visit a farm sometime in the future to pick fresh fruit or vegetables?

3. Would you say it is very likely, somewhat likely, not very likely, or not at all likely that you or your family might visit a farm to enjoy its environment (for example, things like viewing country scenery, viewing farm animals, learning more about farming methods, or experiencing and gaining an appreciation for farm values and lifestyle)?

4. If a guide or outfitting service were available in Georgia that could provide access to recreational opportunities (such as, hunting, angling, camping, hiking, bike riding, canoeing, bird watching, horseback riding) to you in a rural setting, would you use it?

The reason these questions were chosen to gather data on participation rates was because they were specifically written to ask if it would be likely / unlikely that the respondent would participate in agritourism and nature-based rural recreation. The reason there were four questions instead of one was because there were too many activities to group into one question. Grouping all activities into one question would cause participation rates to be overstated. Doing this could potentially throw off the data to the question because the respondent could dislike all but one activity, and by

answering “I would be very likely to participate” it would lead researchers to believe that the respondent liked each of the activities rather than the single activity the respondent found interesting. Simply put, splitting up the questions made it easier to determine which activities respondents would participate in and which activities respondents would not participate in.

Question 4 was the question that was analyzed in this thesis in order to determine the economic impacts of guide services for hunting, angling, and wildlife viewing. The steps taken in order to determine the economic impacts could have easily been performed on questions 1, 2, or 3, however, determining the economic impacts of guide services was an objective in this thesis requiring the use of question 4. Questions 1-3 were included in the thesis in case readers may want to perform the analysis on their own.

FUNCTIONAL FORM OF THE PARTICIPATION MODEL

The functional form of the participation model is extremely important if the model is to have reliable and unbiased estimators. The participation model was used to estimate the probability that an individual will participate in a given recreation activity based on the individual’s characteristics and demographics. Again, the variables chosen are variables that closely resemble other previous participation model variables. There are other variables that are frequently used in other models; however, due to the different nature of our survey some of those variables could not be included. The functional form of the participation model specified for this thesis is:

(2.) $\textbf{Participation}_{p} = \beta_0 + \beta_1 A_p + \beta_2 G_p + \beta_3 E_p + \beta_4 I_p + \beta_5 P_h + \beta_6 E_p + e$

ECONOMIC IMPACT SURVEY BACKGROUND AND METHODOLOGY

Expenditure data were obtained from the U.S. Fish and Wildlife Service's 1996 National Survey of Angling, Hunting, and Wildlife-Associated Recreation. This survey broke down data into state-by-state categories, which is how expenditure data for the state of Georgia was obtained. The survey gathered information on the number of anglers, hunters, and wildlife-watching participants in the United States. Information is also collected on how often these recreationists participate and how much they spend on their activities (U.S.F.W.S., 1996).

State fish and wildlife representatives assisted the International Association of Fish and Wildlife Agencies (IAFWA) representatives in the survey planning and design. The U.S. Bureau of Census conducted the survey in two phases for the Fish and Wildlife Service. The first phase was the screening phase, which involved surveying 1,366 households statewide, primarily by telephone, to determine who in the households fished, hunted, or participated in wildlife-watching activities in 1995 and 1996. Of these interviews, 825 completed household interviews were obtained for a response rate of approximately 80.9 percent (U.S.F.W.S., 1996).

The second phase of the survey process consisted of detailed interviews conducted nearly every four months. Interviews were conducted with samples of likely anglers, hunters, and wildlife-watching participants who were identified in the initial screening phase; however, the participants were categorized for the second phase as "sportsmen" and "wildlife-watchers" and not broken down into hunters and anglers. Most of the interviews were conducted by telephone and several were conducted in person if the respondent could not be reached by telephone.

Respondents in the second phase of surveys were all 16 years of age or older. "Sample sizes were designed to provide statistically reliable results at the State level for angling, hunting, and wildlife-watching activities" (U.S.F.W.S., 1996). The 1996 sample was selected from the 1991 sample. The 1996 sample was also supplemented with a "panel of newly constructed housing units to account for housing units built after the 1991 sample selection" (U.S.F.W.S., 1996)

For the "sportsmen" portion of the second phase of the survey, 590 people were designated for interviews in Georgia and 465 were completed. This gives a response rate of 78.8 percent. For the "wildlife-watching" portion of the second phase of the survey, 446 people were designated for interviews in Georgia and 352 were completed. This yields a response rate of 78.9 percent (U.S.F.W.S., 1996). Detailed weighting procedures for the second phase of this survey are explained in the U.S. Fish and Wildlife Service's packet titled: 1996 National Survey of Angling, Hunting, and Wildlife-Associated Recreation: Georgia.

Hunting, in this study, will focus on hunters who were not only licensed hunters, but also those who had no license. Also included are hunters engaged in hunting with a bow and arrow, muzzleloader, and other primitive firearms, or a pistol or handgun. Hunting expenditures included four types of hunting: (1) big game, (2) small game, (3) migratory bird, and (4) other animals. The data and expenditures that will be reported from these separate categories will be aggregated.

Angling, in this study, will focus on anglers who were not only licensed hook and line anglers, but also those who have no license and those who use special methods such as angling with spears. Three types of angling are aggregated for this thesis:

(1) freshwater, excluding the Great Lakes, (2) Great Lakes, and (3) saltwater. Again, the data and expenditures that will be reported from these separate categories will be aggregated.

Wildlife-associated recreation encompasses observing wildlife, photographing wildlife, and feeding wildlife. Secondary wildlife-watching activities, such as incidentally observing wildlife while pleasure driving, are not included.

EXPENDITURES FOR IMPLAN

In order to use impact analysis effectively it is critical that expenditure data is obtained for the market area. The market area for this thesis are all counties within a 135-mile radius of the center of the impact region. Fortunately, the U.S. Fish and Wildlife Service (U.S.F.W.S.) performs a comprehensive survey for each state in the U.S. every six years to determine expenditures for different outdoor recreation activities.[4]

Ultimately, the goal for our impact analysis is to determine the economic impacts that guide services for hunting, angling, and wildlife viewing has on our study area. This will be determined using the expenditures reported by the U.S. Fish and Wildlife Service. Following guidelines from other previous economic impact papers, expenditure data provided by the U.S.F.W.S. needed to be entered into the IMPLAN model on a thousand-day basis. The U.S.F.W.S. data was reported on a per-year basis, therefore, several procedures were taken in order to convert these expenditures into thousand-day

[4] 1996 expenditures were used in place of 2002 expenditures because the U.S.F.W.S. performs these surveys every six years and the 2002 expenditures had not yet been released at the time this thesis was written.

expenditures making it possible for them to be entered into IMPLAN. These procedures are outlined and explained in the remainder of this chapter.

Using the 1996 National Survey of Angling, Hunting, and Wildlife-Associated Recreation for Georgia expenditure data was obtained for the expenditures participants incur while participating in hunting, angling, and wildlife viewing. The categories that were included in the U.S.F.W.S survey that were used in the IMPLAN model were: Food Expenses, Lodging Expenses, Transportation Expenses, Equipment Rental, Equipment Purchases and Other. Also included was the mean fee that survey respondents would be willing to pay for guide service while hunting, angling, and wildlife viewing, however, these expenditures were not reported on the U.S.F.W.S. survey. Table 5 reports the participation statistics by activity (Hunting, Angling, and Wildlife Viewing) for the entire state of Georgia in 1996 as reported in the U.S.F.W.S. survey.

The procedure for calculating the Average Trip Related Expenditure per Participant (Table 5, Column 4) is to first divide Total Trip Related Expenditures (Table 5, Column 3) by the Number of Participants (Table 5, Column 1). Once the Average Expenditure per Participant has been calculated, the Average per day Expenditure can then be calculated (Table 5, Column 5). To determine the Average per day Expenditure, the Average Expenditure per Participant (Table 5, Column 4) is divided by the Average Number of Days participants partake in each activity (Table 5, Column 2).

Table 6 reports the total 1996 expenditures by activity in Georgia broken down by category. Initially, one of the issues that needed to be overcome involving the 1996 expenditure data was that Food and Lodging were reported as a single category. Since these are such large and unique sectors of an economy and since previous studies

Table 5. Participation statistics by activity for the state of Georgia (1996 Data)

ACTIVITY	Number of Participants	Average # of Days	Trip Related Expenditure	Average per Participant	Average Per Day Expenditure
HUNTING	17,088	17 Days	4,536,800	265	16
ANGLING	46,640	14 Days	13,228,800	287	20
WILDLIFE VIEWING	87,514	5 Days	4,960,800	183	37

Table 6. Total categorical expenditures by activity for the state of Georgia (1996 Data)

ACTIVITY	Equipment and Other	Food	Lodging	Transportation	Equipment Rental	Total Category Expenditure
HUNTING	31,198,595	1,422,330	814,329	1,666,801	641,057	35,743,200
ANGLING	34,301,600	3,066,368	1,724,832	3,222,400	5,215,200	47,530,400
WILDLIFE VIEWING	30,388,539	2,003,391	1,125,769	1,200,638	643,183	35,361,600

had these categories separated it was determined that the separation of food and lodging expenditures into two distinct categories was necessary. Literature states that IMPLAN is most effective when expenditures for categories (such as food and lodging) are broken down into separate categories rather than aggregated. If categories such as food and lodging are aggregated then there would be no way of knowing how they independently affect an economy. For this reason, food and lodging were disaggregated. A previous study conducted by Michigan State University found that Lodging accounted for 35.8 percent of the summed Food and Lodging expenditure total in 1997, while Food accounted for the remaining 64.2 percent of this total (M.S.U. Dept. of Park, Recreation, and Tourism Resources, 2002).[5] Following these percentages, "Food and Lodging" were disaggregated assigning Food 64 percent of the total "Food and Lodging" expenditure and assigning Lodging the remaining 36 percent of the total.

Using the Average per day Expenditure found on Table 5, Column 5, the allocation, or breakdown, of this expenditure will be explained for Hunting (Table 7). The same steps are followed to determine the allocation of the Average per day Expenditures for Angling and Wildlife Viewing (Tables 8 and 9, respectively).

Using Table 6, divide each category for Hunting (Table 6, Row 2, Columns 2-7 (Equipment and Other, Food, Lodging, Transportation, and Equipment Rental)) by the Total Category Expenditure for Hunting (Table 6, Column 6, Row 2) to determine the ratio that each category was to the total expenditure. For example, looking at Table 6, Activity "Hunting", Category "Equipment and Other": Divide 31,198,595 by Total

[5] The M.S.U. study encompassed motel nights, camping nights, seasonal houses, and staying with friends and family under the total Lodging expenditure, while the Food expenditure was composed of cost of groceries as well as expenditures from eating at restaurants.

Table 7. Allocation of total, per-day hunting expenditures for each expenditure category

HUNTING- $16
Average per day
Expenditure

Category	Percentage of Per Day Expenditure	Amount
	%	$
Equipment and Other	87.42	13.98
Food	3.94	0.63
Lodging	2.22	0.35
Transportation	4.62	0.73
Equipment Rental	1.77	0.28
Total	100	16.00

Table 8. Allocation of total, per-day angling expenditures for each expenditure category

ANGLING- $20
Average per day
Expenditure

Category	Percentage of Per Day Expenditure	Amount
	%	$
Equipment and Other	72.16	14.43
Food	6.45	1.29
Lodging	3.62	0.72
Transportation	6.77	1.35
Equipment Rental	10.97	2.19
Total	100	20.00

Table 9. Allocation of total, per-day wildlife-viewing expenditures for each expenditure category

WILDLIFE VIEWING-
$37 Average per day Expenditure

Category	Percentage of Per Day Expenditure	Amount
	%	$
Equipment and Other	86.09	31.85
Food	5.60	2.07
Lodging	3.15	1.16
Transportation	3.35	1.24
Equipment Rental	1.79	0.66
Total	100	37.00

equals .8742 or 87.42 percent. This means that 87.42 percent of all hunting expenditures fell under the category of "Equipment and Other". This figure is recorded on Table 7, Column 2, Row 2, and then multiplied by the $16 Average per day Expenditure (found on Table 5, Column 6, Row 2) to get $13.98 (shown on Table 7, Column 3, Row 2). To determine the percentage of hunting expenditures that falls under the "Food" category, simply divide Activity "Hunting", Category "Food" in Table 6 by Total Hunting Expenditures ($1,422,330 / $35,743,200) yielding 3.94 percent (Table 7, Column 2, Row 3). 3.94 percent is then multiplied by the $16 Average per day Hunting Expenditure (Table 5, Column 6, Row 2) to yield $.63 (Table 7, Column 3, Row 3). Once all percentages are found, plotted, and summed in Table 7, Column 2, it will equal 100 percent. Once all "Amounts" are determined and summed from Table 7, Column 3 it will equal the Average per day Expenditure spent by a participant while Hunting found on Table 5, Column 5. This is the procedure followed for Hunting, however, the same procedures are followed for Angling and Wildlife viewing and results are reported on Tables 8 and 9.

Another issue that needed attention regarding the 1996 expenditure data and IMPLAN was determining what percentage of the expenditures actually occurred within the 14 county region in Southwest Georgia and what percentage of the expenditures were made outside of the region while traveling to or from the recreation site. Expenditures made outside of the 14 county region while traveling to or from the recreation site are called "en-route expenditures." These expenditures, although not made inside the impact region, are still classified as expenditures for this thesis. IMPLAN is designed specifically to determine the effects of money spent within the impact region; Dollars

spent outside of the impact region en-route to or from recreation destinations, have no economic impacts on jobs, employment, or taxes within the impact region when using IMPLAN. It was critical, therefore to determine how much of the total expenditures were made within the fourteen county study area and how much were made outside as the participant traveled to the area in study. It was assumed that 100 percent of the "Equipment Rental" expenditures occurred within the impact region. This means that when a person goes on a recreational outing and they rent a piece of equipment that is used for recreation, 100 percent of the money spent to rent that piece of equipment was spent inside of the impact region. This is assumed because it would be much easier to rent equipment near the recreation site and avoid having to travel with the equipment. This would save space in a car or whatever transportation device used to get a person or family to a recreation site.

It was hypothesized that 100 percent of "Lodging" expenditures occurred within the region of study. This was assumed because recreation within the state of Georgia was the focus, and it was hypothesized that nearly all of the people recreating would not travel overnight to recreate.[6] This would mean that all expenditures made for lodging would be made to spend the night at or near the recreation site. Next, it was hypothesized that 40 percent of "Food" expenditures occurred within the impact region. It was assumed that most of the people participating in recreation would participate only on weekends. It was determined, therefore, that the food expenditures made on the way to or from the recreation destination (outside of the impact region) would be roughly 60 percent and the expenditures made while they were at or near the recreation site would be

[6] It was assumed that the recreation destination was the final destination and that it was not a "stop-over" spot on the way to the final destination.

roughly 40 percent. It was then hypothesized that 50 percent of "Transportation Expenditures" occurred within the region. For the same reason explained in the food category it was assumed that one-half of the gas, oil, and other expenditures made for automobiles (or other means of travel) would be made en-route, outside the impact region, on the way to or from the recreation site, while the other half would be made while the participant was at or near the recreation site. Lastly, it was hypothesized that 50 percent of "Equipment Purchases and Other" expenditures occurred within the 14 county region in Southwest Georgia. The assumption was made that people participating in recreation owned the majority of the large equipment that was necessary for them to recreate (such as guns, cameras, lenses, tents, and boats). It is believed, however, that there would be other items that the participant would forget or realize they needed when they got to the recreation site such as film, lens cleaners, string, extra ammunition, tarps, fishing line, fishing lures, or extra fishing poles, etc. These other items are estimated to account for 50 percent or all Equipment and Other purchases.[7]

Table 10, Hunting Expenditures per day in the 14-County impact Region was determined by taking each amount from Table 7, column 3 and transferring them to Table 10, Column 2. Each percentage of expenditure determined to have been spent inside the impact region (50 percent for Equipment and Other, 40 percent for Food, 100 percent for Lodging, 50 percent for Transportation, and 100 percent for Equipment Rental) is put in Table 10, Column 3. To determine the Amount Spent in the 14-County Region for Hunting (Table 10, Column 4, Row 2) simply multiply Total Trip Expenditure for

[7] There was no model to refer to on how to convert total expenditures to en-route expenditures or expenditures made within the impact region. A hypothesis was made on the percentages of the total expenditures that were made en-route and the expenditures that were made within the impact region.

"Equipment and Other" (Table 10, Column 2, Row 2) by the Percentage Spent in the 14-County Region (Table 10, Column 3, Row 2). Once each category's total Trip Expenditure is multiplied by each category's "Percentage Spent Inside the Impact Region" to get the totals for Table 10, Column 4, add Column 4 to determine the average amount each participant spends inside the impact region ($8.24 for Hunting; shown on Table 10, Column 4, Row 7). This is the procedure followed to determine the per day hunting expenditures made inside the 14-county impact region, however, the same procedures are followed to determine the expenditures made within the 14-county impact region for angling and wildlife viewing (shown on Tables 11 and 12, respectively). The last set of expenditures that were included in the impact analysis (IMPLAN) were the mean expenditures that the participants in the participation survey reported they would be willing to pay for guide services for hunting, angling, and wildlife viewing.

The final step in converting the 1996 U.S. Fish and Wildlife Service expenditures into expenditures suitable to be entered into the IMPLAN model is to put trip expenditures on a thousand-day basis. Putting expenditures on a 1,000- day basis is a standard procedure when analyzing the economic impacts on economies and has been done in many previous economic impact papers. It also allows estimated expenditures to be flexible for many different types of analysis.

Table 13 shows expenditures by activity and category made within the 14-county impact region represented on a thousand-day basis (for example, the Activity of Hunting and the Category of Food). The process to determine the expenditures by category made within the 14-county region represented on a thousand-day basis for Hunting (Table 13, Row 2) is simply to look at Table 10, Column 4 (Amount Spent in 14-County Region:

Table 10. Hunting expenditures per day, per participant in the 14-county impact region

HUNTING

Category	Total Trip Expenditure	Percentage Spent in 14-County Region	Amount Spent in 14-County Region
	$	%	$
Equipment and Other	13.98	50	6.99
Food	0.63	40	0.25
Lodging	0.35	100	0.35
Transportation	0.73	50	0.37
Equipment Rental	0.28	100	0.28
Total	**16.00**		**8.24**

Table 11. Angling expenditures per day, per participant in the 14-county impact region

ANGLING

Category	Total Trip Expenditure	Percentage Spent in 14-County Region	Amount Spent in 14-County Region
	$	%	$
Equipment And Other	14.43	50	7.22
Food	1.29	40	0.52
Lodging	0.72	100	0.72
Transportation	1.35	50	0.68
Equipment Rental	2.19	100	2.19
Total	**20.00**		**11.32**

Table 12. Wildlife viewing expenditures per day, per participant in the 14-county impact region

WILDLIFE VIEWING

Category	Total Trip Expenditure	Percentage Spent in 14-County Region	Amount Spent in 14-County Region
	$	%	$
Equipment And Other	31.85	50	15.93
Food	2.07	40	0.83
Lodging	1.16	100	1.16
Transportation	1.24	50	0.62
Equipment Rental	0.66	100	0.66
Total	**37.00**		**19.19**

Table 13. Categorical expenditures by activity made within the 14-county impact region represented on a thousand-day basis (IMPLAN expenditures)

ACTIVITY	Equipment And Other	Food	Lodging	Transportation	Equipment Rental	Guide Service
HUNTING	6,990	250	350	370	280	98,920
ANGLING	7,220	520	720	680	2,190	79,070
WILDLIFE VIEWING	15,930	830	1,160	620	660	65,350

(Hunting) and multiply each number by 1,000 days. For example, to determine the expenditures made within the 14-county impact region for the activity Hunting and category Equipment and Other (shown on Table 13, Column 2, Row 2), $6.99 (Table 10, Column 4, Row 2) was multiplied by 1,000 days, totaling $6,990. For the Activity Hunting and Category Food (shown on Table 13, Column 3, Row 2) Table 10, $0.25 (Table 10 Column 4, Row 3) was multiplied by 1,000 days, totaling $250. For the Activity of Hunting, each number in each row of Column 4 (Table 10) was multiplied by 1,000 days to yield the thousand-day expenditure for each category of the activity Hunting (shown in Table 13, Row 2, Columns 2-6).

The processes to determine the thousand-day expenditures for Angling and Wildlife Viewing are exactly the same as they were for Hunting, however Table 11, Column 4 numbers were multiplied by 1,000 days for the thousand-day Angling expenditures (shown on Table 13, Row 2, Columns 2-6) and Table 12, Column 4 numbers are multiplied by 1,000 days to determine the thousand-day expenditures for Wildlife Viewing (shown on Table 13, Row 3, Columns 2-6).

The thousand-day expenditures for Guide Services (Table 13, Column 7) were found in a similar manor as the categories Equipment and Other, Food, Lodging, Transportation, and Equipment Rental, however, different tables were used to get the expenditures for Guide Services to multiply by thousand-days. For the activity Hunting, thousand-day Guide Fee expenditures were determined by looking at the SAS output and finding the Mean Willingness to Spend to hunt ($98.92) and multiplying by 1,000 days to determine the thousand-day expenditure for Guide Services for the activity of Hunting (shown on Table 13, Column 7, Row 2). The thousand-day expenditure for Guide

Services for the activity of Angling was calculated by looking at the SAS output and finding the Mean Willingness to Spend for Angling ($79.07) and multiplying by thousand-days (shown on Table 13, Column 7, Row 3). Finally, the thousand-day expenditure for Guide Services for the activity of Wildlife Viewing was calculated by looking at the SAS output and finding the Mean Willingness to Spend for Wildlife Viewing ($65.35) and multiplying by 1,000 days (shown on Table 13, Column 7, Row 4). Table 13 (Expenditures by category made within the 14-county impacts region represented on a thousand-day basis) shows the numbers that were entered into the IMPLAN model to determine the economic impacts on an economy from guide services for Hunting, Angling, and Wildlife Viewing.

1. Participation Statistics Reported by U.S. Fish and Wildlife Service (Table 5) → 2. Categorical Expenditure by Activity Reported by U.S. Fish and Wildlife Service (Table 6) →

3. Per Day Expenditure and Allocation of Per Day Expenditure by Percentage (Tables 7-9) → 4. Expenditure Per Day, Per Participant in the 14-County Impact Region (Tables 10-12) →

5. Mean Willingness to Spend For Guide Services in 14-County Impact Region → 6. Expenditure Per Day, Per Category In the 14-County Impact Region Multiplied By thousand-days (Table 13) →

IMPLAN EXPENDITURE INPUT

Figure 2. Steps taken in order to convert 1996 expenditures from the U.S. Fish and Wildlife Service into thousand-day expenditures for the IMPLAN model

CHAPTER IV

RESULTS

This chapter will show and explain the results from the participation model as well as the IMPLAN model and explain how these results were implemented to complete the two main objectives of this thesis. The output from the participation model as well as the IMPLAN model will be used to determine the economic impacts that guide services for hunting, angling, and wildlife viewing may have on the 14-county impact region in Southwest Georgia.

On average, participants of the participation survey would be willing to travel 134 miles (one-way) to use a guide service. Out of the 262 respondents to the question, the minimum number of miles any of them would travel to use a guide service was one mile, while the maximum number of miles respondents said was 995.[8] One-hundred and thirty-four miles is roughly a two and a half-hour drive (134 miles / 60 miles per hour = 2 hours and 14 minutes). This shows, on average, the trips people would take to use a guide service, and presumably to recreate, would be day-trips and not overnight drives. This is a large factor when considering how much of the expenditures people spend en-route to the recreation destination (outside the impact region) and how much of the expenditures people actually spend inside the impact region. If more multi-day trips were

[8]The survey only gave the options of travel distance up to "995 +"miles. There is no definitive way to determine the actual maximum mileage willing to travel over 995 miles, so the maximum is reported as 995 miles.

expected then more expenditures would be spent outside the impact region, en-route to the destination.

On average, participants would use guide services 1.25 times in one year. Out of the 391 respondents who answered the question, the average number of citizens in the respondents hometowns was 6,000. The smallest town that a respondent reported they were from had roughly 500 citizens, while the largest town a respondent reported they were from had roughly 50,000 citizens.[9] The average percentage of personal income derived from farming was 5.56 percent with a minimum of 0 percent and a maximum of 100 percent.

The specified participation model specified in Equation (3.) was estimated for questions 1-4, and results are reported in Table 14. Parameter estimates, as well as each variable's standard errors are shown for the specified model questions.[10]

Age was expected to have a positive coefficient. This means that the older person is, the more likely they would participate in agritourism and nature-based rural recreation, resulting in a positive coefficient. The parameter estimate in the model for questions 1 and 2 reported Age at lower than a 90 percent confidence level, rendering the data for those two questions insignificant. Age, regardless of whether it had a positive or non significant coefficient, had low coefficient estimates. This means that age is not a large factor in determining if a person will participate in agritourism and nature based rural recreation.

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[9] The survey only allowed respondents to choose up to "50,000 +"citizens. There is no way to determine the actual number above 50,000 so the maximum is reported as 50,000. It is possible that this number is underestimated due to this fact.

[10] If variables had insignificant coefficients, it may be said that it is not conclusive how that variable affects participation. Results are stated, however, in this section.

It was expected that Gender coefficients be largely positive, meaning if the respondent were male they would be much more likely to participate in the agritourism and nature based rural recreation than if they were female.

In the estimated participation model, question's one and two's gender coefficients were largely positive. Question four was also positive, however, had a lower coefficient. Question three had a negative coefficient. None of the questions were statistically significant at a 90 percent confidence level or higher showing that gender did not significantly affect participation.

Income was expected to have a positive coefficient estimate. It was hypothesized that as the respondents' income increases, so too would the probability that they would participate in agritourism and nature-based rural recreation. For the specified participation model questions, one and two had very small negative coefficient estimates while questions three and four had small positive coefficients. This shows that while income affects participation negatively for activities in question one and two, and positively for activities in question three and four, it is by a very miniscule amount. Only results from question one (with a negative coefficient) prove to be statistically significant at a 90 percent confidence level or greater.

Ethnicity was hypothesized to have a positive coefficient estimate. This means that if the respondent is white, they are likely to participate in agritourism and nature-based rural recreation. Surprisingly, results from the specified model for questions one through three were negative while the question four estimate was positive. Only question one had statistically significant coefficient estimates at 90 percent or greater confidence level. Estimates, although small, are opposite from the original hypothesis and report that

Table 14. Parameter estimates (with standard errors) of the estimated participation model for questions of focus (1-4)

	PARTICIPATION MODEL RESULTS			
EXPLANATORY				
VARIABLES	**Q 1**	**Q 2**	**Q 3**	**Q 4**
INTERCEPT	0.5969	-0.6022	-2.0547	-3.6038
	(0.4104)	(0.4112)	(.4418)***	(.5333)***
AGE	0.00397	-0.00094	0.0199	0.0488
	(0.0067)	(0.0067)	(0.00708)***	(.00806)***
GENDER	0.2979	0.2087	-0.1889	0.0955
	(0.2084)	(0.2076)	(0.2151)	(0.2386)
INCOME	-9.17E-07	-1.29E-07	8.803E-06	3.018E-06
	(5.297E-6)*	(5.325E-06)	(5.546E-06)	(6.364E-06)
ETHNICITY	-0.7335	-0.1401	-0.0867	0.0691
	(0.2540)***	(0.2547)	(0.2681)	(0.3207)
POPULATION	0.00001	0.00002	0.00002	2.216E-06
	(5.058E-6)**	(4.999E-6)***	(5.146E-6)***	(5.865E-06)
EDUCATION	-0.6975	-0.2497	-0.2158	0.0590
	(0.2253)***	(0.2271)	(0.2360)	(0.2690)
Percent Concordant	67.8	63.2	64.4	70.2
N	375	373	372	370
	*** Significant at 99% C.I.	** Significant at 95% C.I.	* Significant at 90% C.I.	

if the respondent is white, they are likely to participate less in agritourism and nature-based rural recreation than if they are black.

It was predicted that Population would have a positive correlation with participation. This means that as the respondent's hometown population increased, so too would their participation in agritourism and nature-based rural recreation. Results for Population show a very small positive coefficient. Questions 1, 2, and 3 all reported confidence intervals of greater than 90 percent so they were significant results. This shows that the original prediction was correct and respondents from hometowns with larger populations have a higher probability of participation that if they were from a smaller town.

It was predicted that Education would have a positive coefficient. This would mean that the more education the respondent has, the more likely they would be to participate in agritourism and nature-based rural recreation. Results show, however, negative coefficients for question 1, 2, and 3, and a small positive coefficient for question 4. Only question 1 had a statistically significant coefficient interval at the 90 percent level. This shows that the more education a person has, the less likely they are to participate in agritourism and nature-based rural recreation.

Table 15 presents the mean, minimum, and maximum for each of the independent variables, as well as the dependent variable from the participation model. Results are presented for each of the questions of focus (Questions 1-4) from the participation survey as well as the Georgia means.

Table 15. A comparison of Georgia means to the four estimated participation model survey questions reported for the dependent variable well as each independent variable

	Georgia	Question 1			Question 2			Question 3			Question 4		
	Mean	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.
Participate	N/A	59.20%	0	1	61.66%	0	1	63.71%	0	1	74.32%	0	1
		(n=375)			(n=373)			(n=372)			(n=370)		
Age	31	43	18	97	43	18	97	43	18	97	43	18	97
		(n=392)			(n=392)			(n=392)			(n=392)		
Gender	48.76% Male	39.90%	0	1	39.90%	0	1	39.90%	0	1	39.90%	0	1
		(n=394)			(n=394)			(n=394)			(n=394)		
Income	$42,433	$49,386	$2,499.50	$75,000	$49,386	$2,499.50	$75,000	$49,386	$2,499.50	$75,000	$49,386	$2,499.50	$75,000
		(n=300)			(n=300)			(n=300)			(n=300)		
Ethnicity	65.1% White	76.80%	0	1	76.80%	0	1	76.80%	0	1	76.80%	0	1
		(n=384)			(n=384)			(n=384)			(n=384)		
Population	52,730	18,199	500	50,000	18,199	500	50,000	18,199	500	50,000	18,199	500	50,000
		(n=392)			(n=392)			(n=392)			(n=392)		
Education	29.3 % Some	69.40%	0	1	69.40%	0	1	69.40%	0	1	69.40%	0	1
	College	(n=392)			(n=392)			(n=392)			(n=392)		

Forty-three was the average age of the survey respondents, as compared to 31 being the average age of the citizens in Georgia (GA County Guide, 1999).[11] Results show that 39.90 percent of the sample, or 157 people, were male, while 48.76 percent of Georgia residents are male (U.S. Census, 2002).

The mean household income (before tax) was $49,386 while the mean income from GA was $42,433. 39.9 percent of the survey respondents were white, while 65.1 percent of Georgia residents are white (U.S. Census, 2002). The mean county population for the survey respondents was 18,199, while the mean Georgia county population in 2001 was 52,730 (U.S. Census, 2002). The mean Georgia county population was determined by dividing the total number of Georgia residents by the total number of Georgia counties (8,383,915 GA residents / 159 GA counties). 69.4 percent of all survey respondents, or 272 people, had some college or had graduated college, while 29.3 percent of Georgia residents had some college or had graduated college (GA County Guide, 1999).[12]

IMPLAN RESULTS

Results from the IMPLAN expenditure input are in terms of Total Employment Impacts, Total Labor Income Impacts, Total Value Added Impact, and the Total Output Impacts. The results are reported in terms of the impacts per thousand-days of guide

[11] 31, the mean age for GA citizens takes into account all citizens, including from age 1 year up to 17 years; Survey questions 1-4 only account for residents aged 18 and older (excluding 1-17). For this reason, the survey question's mean age is overstated when compared the mean age of GA residents.

[12] The GA County Guide reports mean educational attainment for citizens 25 years old and higher, whereas survey questions 1-4 report mean educational attainment for citizens 18 years old and higher. The GA County Guide only reports up to high school graduate and bachelor's degree and higher. This excludes all people who have some college but have not yet graduated. This number was determined by summing all citizens up to high school graduate and "bachelor's degree and higher" and subtracting from 100%.

services for hunting, angling, and wildlife viewing has on the 14-county impact region in Southwest Georgia. In this section, the direct, indirect, and induced effects will be reported. These numbers summed will equal the total impacts.

The impacts from impact studies are not "totals", they are the changes in the total. For instance, if 2 jobs are reported as impacts for hunting, this means that there are 2 jobs created from hunting, and not that there are 2 total jobs in the impact region. These 2 jobs may be added to the number of jobs already in the impact region. The titles to the impact tables are titled "total", however these are the total changes, not the total after the changes.

Total Employment Impacts are the number of jobs that are created as a result of the money that is brought into an impact region from outside the impact region. The expenditures spent on each activity (hunting, angling, and wildlife viewing) create jobs within those industries. Realistically, job functions can overlap for employees who work in industries that sell goods and services for activities such as hunting, angling, and wildlife viewing; however, when estimating the economic impacts that expenditures from these activities create, *employment impacts* report jobs that are separate and distinct. All IMPLAN databases include both full-time and part-time workers in employment estimates (IMPLAN PRO, 1997).

Total Labor Income Impacts are the new incomes that are brought into the impact region created from the expenditures from guide services for hunting, angling, and wildlife viewing. These incomes may either support the new jobs that are created from hunting, angling, and wildlife viewing or they may be divided up amongst the employees

that already work in the hunting, angling, and wildlife viewing industries to raise their existing incomes.

Total Value Added Impacts have four sub-components. These are:

1. Employee Compensation
2. Proprietary Income
3. Other Property Type Income
4. Indirect Business Taxes

***Employee Compensation** describes the total payroll costs (including benefits) of each industry in the region. It includes the wages and salaries of workers who are paid by employers, as well as benefits such as health and life insurance, retirement payments, and non-cash compensation (IMPLAN PRO, 1997).

***Proprietary Income** consists of payments received by self-employed individuals as income. Any income a person receives for payment of self-employed work is counted under proprietary income (IMPLAN PRO, 1997).

***Other Property Type Income** consists of payments from rents, royalties, and dividends. Payments to individuals in the form of rents received on property, royalties from contracts, and dividends paid by corporations are included here as well as corporate profits earned by corporations (IMPLAN PRO, 1997).

***Indirect Business Taxes** consist primarily of excise and sales taxes paid by individuals to businesses. These taxes occur during the normal operation of businesses but do not include taxes on profit or income (IMPLAN PRO, 1997).

Total Output Impacts are a single number in dollars or millions of dollars for each industry. The dollars represent the value of an industry's total production (IMPLAN PRO, 1997).

The number of jobs that are created in Southwest Georgia from expenditures hunters bring into the 14-county impact region every 1,000 days of hunting is 3.2. These are first round effects from money that was brought into the impact region that were not there, and would not be there, if it were not for hunters. These are the direct effects on employment. As the people that are employed by these newly created 3.2 jobs spend money inside the impact region, the expenditures the hunters bring into the economy are being spent a second time within the impact region; these are the indirect effects. The number of jobs that are indirectly created from expenditures hunters bring into the impact region's economy are .1. Finally, as the person who works this job spends money inside the impact region, more jobs are created still. These too are called the indirect effects; as the money that hunters bring into the economy of the 14-county impact region has, at this point, been spent three times within the impact region. The number of jobs created by money being spent a third time within the 14-county Southwest Georgia impact region is .2. The total number of jobs created in the impact region from expenditures hunters bring in every 1,000 days of guided hunting is 3.5 (3.2 + .1 + .2 = 3.5). IMPLAN reports both full and part time jobs, so 3.5 neither gets rounded up to 4 jobs nor rounded down to 3 jobs.

The final objective is to calculate the total estimated economic impacts by activity and category. This is calculated by determining how many potential participants of recreation there are within the market area (which is each Georgia county within 135 miles of the middle of the impact region (minus the 14 county impact region)).[13]

[13] A radius of 135 miles around the impact region was used because the mean distance respondents reported they would travel to recreate was 134 miles. If the radius divided a county, that county was included in the market area if half or more of the county was inside of the boundry.

Table 16. Estimated economic impacts on the 14-county impact region in in Southwest Georgia for every 1,000 days of hunting, angling, and wildlife viewing (IMPLAN, 1997)

		Hunting	Angling	Wildlife Viewing
Employment Impact				
	Direct	3.2	4.4	4.1
	Indirect	0.1	0.2	0.2
	Induced	0.2	0.3	0.3
	Total	3.5	4.9	4.6
Labor Income Impact				
	Direct	27,678	37,784	37,097
	Indirect	3,665	5,083	4,727
	Induced	4,711	6,443	6,286
	Total	36,054	49,310	48,110
Total Value Added Impact				
	Direct	45,435	61,968	61,006
	Indirect	5,623	7,789	7,269
	Induced	8,144	11,139	10,867
	Total	59,202	80,896	79,142
Output Impact				
	Direct	63,680	87,310	84,550
	Indirect	9,576	13,251	12,382
	Induced	13,023	17,812	17,377
	Total	86,279	118,373	114,309

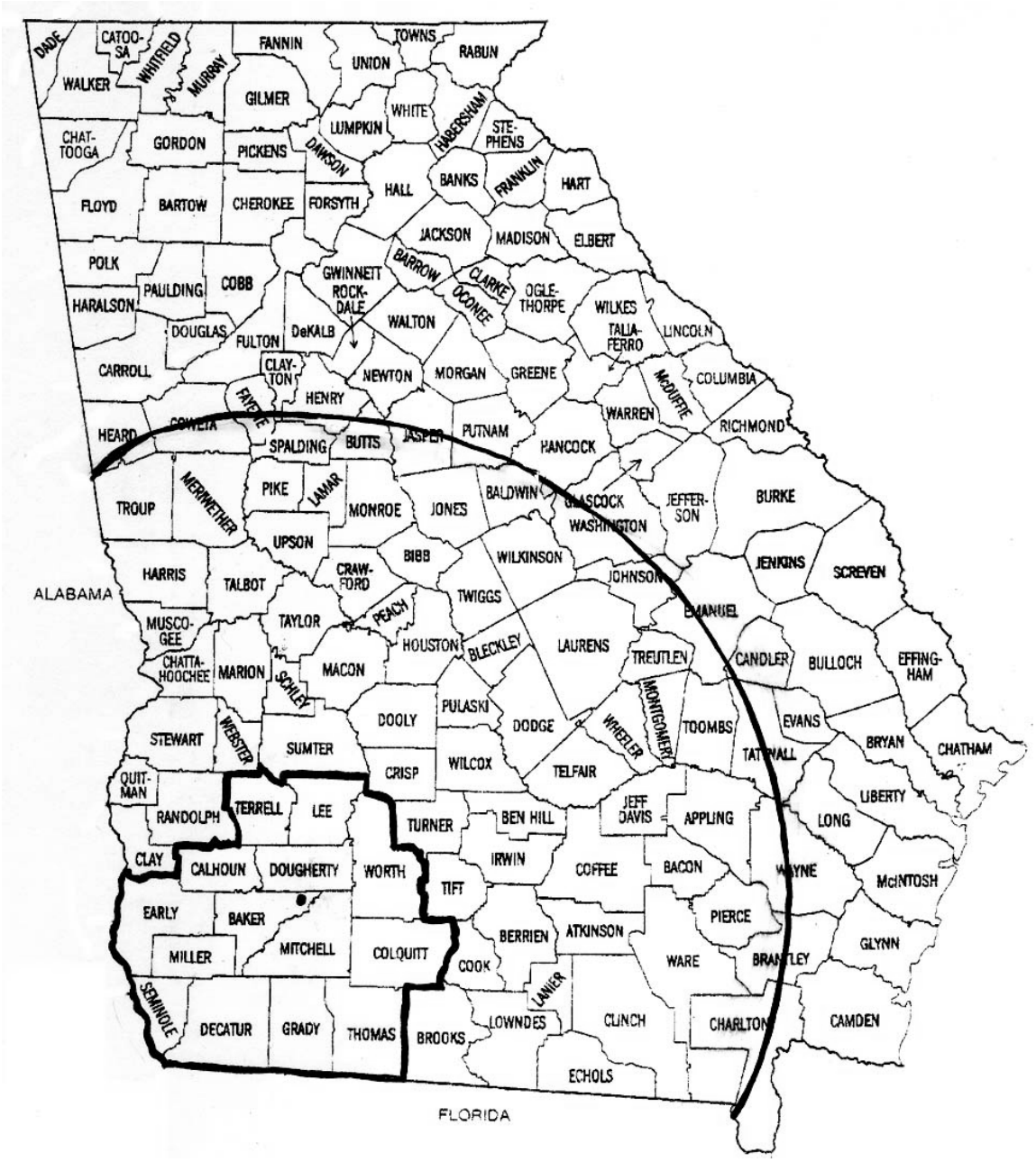

Figure 3. Map of Georgia with 14-County impact region in Southwest Georgia outlined as well as 135 mile radius around center of the impact region. Counties outside of the impact region but inside of the 135-mile radius represent the market area

Table 17. Counties within 135 miles of middle of 14-County impact region and populations of citizens over the age of 18

County	Pop. Over 18	County	Pop. Over 18
Appling	12737	Macon	10,232
Atkinson	5277	Marion	5,165
Bacon	7375	Meriwether	16,607
Baldwin	35083	Monroe	16,327
Ben Hill	12500	Montgomery	6,271
Berrien	11714	Muscogee	134,786
Bibb	112705	Peach	17,905
Bleckley	8613	Pierce	11,507
Brantley	10667	Pike	10,319
Brooks	11986	Pulaski	7,381
Butts	15657	Quitman	1,984
Charlton	7535	Randolph	5,557
Chatahoochee	10836	Schley	2,772
Clay	2519	Spalding	42,941
Clinch	4927	Stewart	3,864
Coffee	27113	Sumpter	24,056
Cook	11384	Talbot	5,081
Crawford	9093	Tattnall	17,259
Crisp	15714	Taylor	6,459
Dodge	14166	Telfair	9,061
Dooly	8668	Tift	28,126
Echols	2634	Toombs	18,646
Harris	18264	Treutlen	5,022
Houston	81415	Troup	42,884
Irwin	7140	Turner	6,792
Jasper	8666	Twiggs	7,730
Jeff Davis	9291	Upson	20,645
Johnson	5996	Wayne	19,966
Jones	17644	Ware	26,726
Lamar	12276	Washington	15,382
Lanier	5184	Webster	1,721
Laurens	33217	Wheeler	4,798
Lowndes	68081	Wilcox	6,723
		Wilkenson	7,498
		TOTAL POP. OVER AGE 18	**1,341,825**

Potential participants of recreation are any person over the age of 18 within the 135 mile boundary of the impact region, outside of the impact region itself. The number of participants in the market area was found to be 1,341,825 (U.S. Census, 2002).

The next step is to determine the participation percentage of the potential participants of recreation. The process for determining the participation percentage is by using the estimated participation model parameter estimates (found in Table 14, Column 5). These parameter estimates are then multiplied by the mean Georgia values for each independent variable (found in Table 15, Column 2, labeled Georgia Mean). The next step is to insert the results from that equation into the logistic distribution function.[14] Inserting values into the estimated participation model results in:

(3.) PARTICIPATION = -3.6038 + .0488 (31) + .0955 (.4876) + .0000003 (42,433) + .0691 (.651) + .0000022 (52,730) + .059 (.293)

PARTICIPATION = -1.73736

The logistic distribution function is used in logit models when determining the probability that an event will, or will not, happen. Using this equation will yield a number, P_i, between 0 and 1; this number is the estimated percentage of the participants in the market area that will participate in guided hunting, angling, or wildlife viewing.[15] The logistic distribution function takes the form:

[14] The estimated participation percentage figure shown above uses only parameter estimates reported for question 4. Participation percentages were found for each question, however, to determine the economic impacts of guide services for hunting, angling, and wildlife viewing only question four results were needed.

[15] If P_i shows the percentage that will participate, $1-P_i$ shows the percentage that will not participate.

$$\textbf{(4.)}\ P_i = \frac{1}{1 + e^{-Z_i}}$$

where $e = 2.70828$ and $Z_i = \beta_0 + \beta_1 (A_p) + \beta_2 (G_p) + \beta_3 (E_p) + \beta_4 (I_p) + \beta_5 (P_h) + \beta_6 (E_p)$

$$P_i = \frac{1}{1 + 2.781828^{-(-1.7376)}}$$

$$\boldsymbol{P_i} = \textbf{.1497 or 14.97 \%}\ [16]$$

Equation (4.) results show that 14.97 percent of all the potential participants in the market area would participate in agritourism and nature-based rural recreation with a guide or outfitting service. Participation percentages for questions 1, 2, and 3 were 46.57 percent, 61.32 percent, and 51.06 percent, respectively, however, they are not used in this thesis.

The next step in determining the total economic impacts of guide service on Southwest Georgia is to multiply the number of potential participants in the market area (1,341,825) by the participation percentage (.1497). This will determine the estimated number of people in the market area that will participate in a guided activity.

(5.) 1,341,825 total in market area (x) .1497 participation percentage

= 200,872 total participants in market area

[16] For a more extensive explanation of the logit distribution function, see D.N. Gujarati, *Basic Econometrics,* McGraw-Hill, Inc., New York, 1995.

The next objective is to determine low, medium, and high estimated economic impacts of guide services for each activity (hunting, angling, and wildlife viewing). In order to determine a low estimate for the economic impacts created by guide services, the number of participants in the market area (200,872) must be multiplied by the minimum number of days people would participate in guide services (1 day). This will determine a low estimate of the total days of participation for guide services.

(6.) 200,872 Participants (x) 1 Day = 200,872 low estimate of total days of participation

The next step is to divide the low estimate of the total days of participation (200,872) by 1,000; this will put days of participation on a thousand-day basis.

(7.) $\frac{\text{200,872 days of participation}}{\text{1,000 days}}$

= 201 thousand-days of participation

The final step to determine the low estimate for total economic impacts is to multiply the total thousand-days of participation (201 thousand-days) by the economic impacts per thousand-days (Table 16). This will yield a low estimate for the total economic impacts on the impact region.

The way to determine a high estimate for the total estimated economic impacts is by first multiplying the total estimated participants in the market area (200,872) by a high estimate of participation days (5 days).

(8.) 200,872 Participants (x) 5 Days = 1,004,360 high estimate of total days of participation

The next step is to divide the high total of estimated days of participation (1,004,360) by 1,000 days. This will put days of participation on a thousand-day basis.

(9.) $\frac{1{,}004{,}360 \text{ days of participation}}{1{,}000 \text{ days}}$

= 1,005 thousand-days of participation

The final step to determine the high estimate for the total estimated economic impacts is to multiply the total thousand-days of participation (1,005 thousand-days) by the economic impacts per thousand-days (Table 16). This will yield a high estimate for the total economic impacts on the impact region. The way to determine a medium estimate for the total estimated economic impacts is by calculating the mean of the low and high estimates of the total estimated economic impacts.

The final estimated economic impacts take into account Leakages, which are "any payments made to imports or value added sectors which do not in turn re-spend the dollars within the region." An example of leakeages for this thesis is when a hotel inside the impact region rents a room to a visitor from outside the region; the next day the hotel must clean the linens and re-stock other supplies used by the visitor. If the company that provides the hotel with supplies to re-stock their inventory is from outside the impact region then a portion of the total expenditure brought into the impact region has *leaked* out when the hotel pays them.

IMPLAN makes the assumption, called Supply/Demand Pooling, that all commodity production in a region that can be used will be used to satisfy regional demand. A supply/demand trade flow is calculated by subtracting gross regional commodity demand from net regional commodity supply. This value is an indicator of domestic import requirements and domestic exports. Negative values indicate that commodities must be imported into the region to satisfy demand and positive values indicate that supply exceeds demand and the excess is exported to other regions.

If a negative value is found for supply/demand pooling the next value that would be useful is to determine how much of the total local demand is met by local production and how much demand must be imported; this is found by a Regional Purchase Coefficient (RPC). An RPC value of 0.8 indicates that local suppliers provide 80 percent of the local demand for a commodity. The remaining 20 percent of demand is imported. IMPLAN generates RPC's automatically and all industries are treated equally for a commodity unless specified otherwise (each industry that demands supplies, for example, will take an equal proportion of its needs from local sources based on that RPC). The total estimated economic impacts reported in tables 18 – 20 have accounted for leakages using supply/demand pooling and RPC's and totals are reported after leakages have been subtracted out. A more in-depth explanation of leakages, supply/demand pooling, and RPC's can be found in the IMPLAN Pro guide (IMPLAN PRO, 1997)

Total estimated economic impacts by activity and category on the 14-county impact region in southwest Georgia are presented in Tables 18, 19, and 20. The low estimated economic impacts reported in these tables are the impacts that occur every

200,872 days of hunting, angling, or wildlife viewing; high economic impacts occur every 1,004,360 days of hunting, angling, and wildlife viewing.[17]

Table 18 reports a low estimate of "Total Output" for hunting guide services at $17,342,079, while the medium estimated value is $52,026,237; the high estimated Total Output value is $86,710,395. Total Output impacts represent the value of an industry's total production, and are by far the largest values when comparing against all other economic impacts. Total Output impacts for Hunting are lower than both the Total Output values for Angling and Wildlife Viewing; with Total Output values for Angling being largest of all.

The Total Labor Income impacts represent the incomes that are created due to guide services for hunting, angling, and wildlife viewing. Total Labor Income impacts are largest for Angling, however, are very closely followed by Wildlife Viewing and then Hunting.

Total Value Added impacts represent most types of incomes (salaries, wages, payments to self-employed business owners, rents, royalties, dividends, and taxes). This value has the second highest dollar value out of the four economic impact measures. This value is largest for Angling, followed by Wildlife Viewing and then Hunting.

Total Employment impacts represent the total number of jobs created by guide services for hunting, angling, and wildlife viewing. These numbers are not comparable to the other three economic impact measures, as they are not in monetary units. Angling has the most jobs created by guide services followed by Wildlife Viewing and then Hunting.

[17] The medium number of days (602,616) is the average of the high and low number of days.

Table 18. Total estimated economic impacts from hunting guide services on the 14-county impact region in Southwest Georgia

	Total Low, Medium, and High		
	Estimated Economic Impacts from Guide		
Economic	Services for Hunting on the Impact Region		
Impact			
Measure	Low	Medium	High
Total			
Output	17,342,079	52,026,237	86,710,395
Total			
Labor			
Income	7,246,854	21,740,562	36,234,270
Total			
Value			
Added	11,899,602	35,698,806	59,498,010
Total			
Employment	703.5	2,110.5	3,517.5

Table 19. Total estimated economic impacts from angling guide services on the 14-county impact region in Southwest Georgia

	Total Low, Medium, and High		
	Estimated Economic Impacts from Guide		
Economic	Services for Angling on the Impact Region		
Impact			
Measure	Low	Medium	High
Total			
Output	23,792,973	71,378,919	118,964,865
Total			
Labor			
Income	9,911,310	29,733,930	49,556,550
Total			
Value			
Added	16,260,096	48,780,288	81,300,480
Total			
Employment	984.9	2,954.7	4,924.5

Table 20. Total estimated economic impacts from wildlife viewing guide services on the 14-county impact region in Southwest Georgia

	Total Low, Medium, and High Estimated		
	Economic Impacts from Guide Services		
Economic	for Wildlife Viewing on the Impact Region		
Impact			
Measure	Low	Medium	High
Total			
Output	22,976,109	68,928,327	114,880,545
Total			
Labor			
Income	9,670,110	29,010,330	48,350,550
Total			
Value			
Added	15,907,542	47,722,626	79,537,710
Total			
Employment	924.6	2,773.8	4,623

CHAPTER V

SUMMARY AND CONCLUSION

The purpose of the fifth chapter is to bring this thesis to a conclusion. A concise summary will be presented along with conclusions reached from the results of the participation model and impact analysis. Limitations of the thesis will be addressed and future research needs will be recommended. Finally, the results from this thesis will be addressed in terms of how they may affect future policy.

SUMMARY OF THESIS

Researchers in the University of Georgia's Department of Agriculture and Environmental Sciences constructed questions for a survey that was intended to assess Georgia residents' interest in agritourism and knowledge of environmental issues related to agriculture. The survey was then conducted and 395 responses were received.

A cross-sectional, logistic participation model was constructed in order to determine the factors that affect participant's decision whether to participate or not in agritourism and nature-based rural recreation. This model ultimately provided data to determine a participation percentage for the designated market area, which were all of the Georgia counties within a 135-mile radius of the center of a 14-county impact region in Southwest Georgia.

The next objective for this thesis was to estimate the total economic impacts that guide services for hunting, angling, and wildlife viewing may have on a specified 14-

county impact region in Southwest Georgia. Expenditure data was received from the U.S. Fish and Wildlife Service for the state of Georgia. These expenditures were broken down into total expenditure per day by category in the 14-county impact region. From there, the mean willingness to spend for guide services in the 14-county impact region were added and the expenditures and guide fees were multiplied by 1,000 days in order to get expenditures on a 1,000-recreational day basis. Expenditures were contoured into 1,000-recreational day expenditures in order to run an impact analysis on them.

Once the impact analysis was performed results were obtained to determine the estimated economic impacts that guide services might have on the impact region on a thousand-day basis. The next step in estimating the economic impacts that guide services could potentially have on the 14-county impact region in Southwest Georgia was to determine the participation percentage of the total number of Georgia citizens eighteen years old and older inside the market area. A participation percentage was calculated and multiplied by the total number of citizens eighteen years old and older in the market area (outside of the 14-county impact region) to determine the total number of willing participants to participate in hunting, angling, and wildlife viewing using a guide. The number of participants were then multiplied by a low, medium, and high estimate of the number of days each participant would use a guide service to recreate (1, 3, and 5 days). The total number of willing participants inside the market area was then divided by 1,000 in order to determine the number of participants in the market area on a thousand-day basis. Lastly, the total number of thousand-day participants was multiplied by the economic impacts that were calculated on a thousand-day basis yielding the total economic impacts within the 14-county impact region.

It was found that expenditures from angling created the largest economic impacts in terms of total output, total labor income, total value added, and total employment. Wildlife viewing created the second largest economic impacts in term of total output, total income, total value added, and total employment, however, the difference between economic impacts created from angling and wildlife viewing were extremely small. Impacts created from hunting were substantially lower than those of angling and wildlife viewing, however, they were still impressive. This was somewhat expected as previous studies have indicated that participation in hunting is, and has been, declining.

It was determined through results from the participation model that age plays a very small factor in whether a person participates in agritourism and nature-based rural recreation or not. Gender, as expected does play a small role in determining if a person will participate in agritourism and nature-based rural recreation. As women have become more active outside of the home over the past 20 years, it is predicted that gender will become less influential in determining whether or not a person participates in tourism and / or recreation in the future. The model that produced statistically significant results for whether the variables "income" and "ethnicity" affected participation in agritourism and rural recreation stated that income has a negative correlation with participation. Although the participation model reports that income negatively affects participation, it affects it very little; ethnicity, on the other hand, negatively affects participation in a larger way. The populations of the survey respondent's hometowns play positive, yet small roles in whether people participate in agritourism and nature-based rural recreation or not. And lastly, it is reported in all but one model that education plays a negative role in the participation of agritourism and nature-based rural recreation.

POLICY IMPLICATIONS

The results from this thesis show an unquestionable demand for agritourism and nature-based rural recreation. As farming, and farmers, continue to take hits due to uncontrollable circumstances, such as weather and government policy issues, this study shows that agritourism and nature-based rural recreation are tremendously promising industries. These industries, if implemented and fostered by private business owners, farmers, and government policy makers, could give farmers and rural land owners other options besides farming. Whether farmers get out of farming completely, or just take a small amount of capital out of farming production and put it into an agritourism or nature-based rural recreation endeavor, this would diversify farmers "portfolios" and ease the shocks of extremely volatile commodity prices and incomes.

It is up to the governments, citizens of rural counties, as well as anyone with an interest in agriculture, to find ways to push agritourism and nature-based rural recreation into more mainstream lights in rural communities. Whether it be marketing agricultural events to urban, or sub-urban towns or cities, or subsidy programs to take land out of farming production and put it into other endeavors such as hunting plantations or pick-your-own farms, private business owners, government, and anyone with an interest in this industry, play critical roles in helping this industry grow and prosper.

Results of the participation model show that 381 respondents reported that they would travel approximately 20 miles, on average, to pick fresh produce from a farm and approximately 22 miles to visit a farm to enjoy it's scenery. Approximately 265 respondents also reported that they would travel an average of 134 miles one–way to use a guide service an average of 1.4 times a year, and they would stay 3.5 days per trip.

These numbers play an extremely important role in developing a market area. Knowing this type of information lets current business owners, prospective business owner, and governments know what kinds of marketing programs to come up with, who to market to, how far away from their counties to advertise, and what information to include in marketing information. For instance, information on hotels are needed if participants are staying over night, restaurant information would be needed, recreation store information would be in demand, banks hours and locations, public park information, reality information would be desired, and so on.

It is an intention of this thesis to show that this industry does have a demand, not only from a consumer viewpoint, but a producer viewpoint as well. It is very easy for there to be a consumer demand, however, if there is no supply of product, or if the product is out there for the taking but there is no marketing of the product and nobody knows about it, then the market will be left unfulfilled.

LIMITATIONS OF THESIS

The biggest limitation of this study was that the objectives that were set out to accomplish were not exactly those of the researchers who developed the questionnaire. The problem with this was that there were questions that were not asked on the survey that would have helped add more independent variables to the participation model. Adding more independent variables would have helped add validity to the results of the model by yielding more statistically significant independent variables to the specified model. This would have produced more significant results to the economic impact portion of this study.

Another limitation of this thesis was the fact that the questions of focus (questions 1-4) asked about several different activities per question. It would have made the results of the thesis less vague and questionable if the questions asked about one specific activity per question. If the questions would have been written asking about one activity per question there would be no confusion if the respondent was, for example, responding that they would be willing to participate in picking fruit or vegetables, sightseeing, or seeing farm animals (all of which were included in question 1).

Yet one more limitation of this thesis was the fact that U.S. Fish and Wildlife expenditures were used instead of information collected by University of Georgia researchers. The difficulty of this was that IMPLAN needed expenditures in a different format than the way the U.S.F.W.S. reported them. The confusion that contorting the expenditures into the format that IMPLAN required was substantial and may come across as such to readers.

Lastly, the market area for this thesis was only discussed and calculated for the counties within the state of Georgia. Since the impact region is in the southwest corner of Georgia, however, it is very likely that counties from northwest Florida and southeast Alabama could have been included in the true market area. It was determined, when extending the 135-mile radius beyond the state of Georgia, into Alabama and Florida, that seven counties from Alabama could be included in the market area while thirteen counties from Florida could be included. By adding these counties into the market area, this would add a total of approximately 200,373 potential participants from the seven counties in Alabama and 391,733 potential participants from the thirteen counties in

Florida; this would add a grand total of 592,106 potential participants into the market area.

Adding this many potential participants into the market area would have greatly increased the number of participants of agritourism and nature-based rural recreation. This would ultimately substantially increase the total economic impacts that guide services from hunting, angling, and wildlife viewing would have on the fourteen county impact region in southwest Georgia. The reason these counties were not included in the market area was because these counties were not included in the initial survey of respondents and no data was recorded on their attitudes and perceptions of agriculture or nature. Adding these counties into the market area would have biased the data by taking on the assumption that Alabama and Florida residents (within these twenty total counties) would have the same attitudes and opinions to the survey questions as Georgia residents reported. For these reasons, only Georgia counties were included in the market area, however, it is noted that the estimated economic impacts could be understated due to the conservative market area.

It should be noted that this study is intended to be a theoretical guide of how to determine the economic impacts on an impact region. One should note that for actual use of the estimated impacts, additional work needs to be done on how to determine the total number of participants in an impact region. A more reliable source of how to determine participants would take much of the uncertainty out of estimated impacts that agritourism and nature-based rural recreation could provide an impact region.

FUTURE RESEARCH

The fact that nearly one in three jobs are related, in some way, to agriculture warrants future research of this industry. With urban sprawl becoming a major problem in America, the mass building of strip-malls, and with large neighborhoods that take farm and pasture lands out of agricultural production, Americans need to concern themselves with agriculture and rural lands. Since it is not in the scope of this thesis to determine how farming can become a less volatile industry this will not be discussed, however, what is in the scope of this thesis, and what may be discussed, is that if it is apparent that farming is an extremely risky profession what can be done to ease the uncertainty for farmers.

With that, future research needs to be done on which rural activities, or agritourism events, profit the most, are the easiest to start up and keep running efficiently. It is easy to say that there is a market for hunting, angling, and wildlife viewing, however, it would be rather risky for a prospective business owner to get into all three of these businesses at one time. Determining which business profits most and determining start-up costs would be possible by having existing agribusinees owners let researchers look at their books and ask questions about their monthly financial payments and intake. This may be difficult to accomplish, however, as private business owners know that if information is readily accessible to prospective business owners, their existing business may very soon have competition.

Also, it will be important in the future to obtain better data on potential participants of agritourism and nature-based rural recreation. This can easily be done, however, it will require the survey to extend beyond the state of Georgia into Florida and

Alabama. This could complicate the process, however, it will greatly increase the reliability of the economic impact results.

With the demand that agritourism and nature-based rural recreation has shown over the past decade, as well as the fact that small farmers are powerless to risk in the market, there needs to be more research on this industry. Agritourism and nature-based rural recreation are a part of an industry that allows farmers to stay on their land without the risk and uncertainty of farming. Without research and proof that farmers will profit, or at least break-even, however, changing their farming operations to agritourism and nature-based rural recreation operations will be out of the question. For this fact, local, state, and federal governments, private businesses, as well as anyone with an interest in the outdoors and / or agriculture, need to continue to open there eyes to this industry, learn how it can benefit farmers as well as consumers, and help implement the measures that can make this industry a long-lasting success.

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APPENDIX

Agricultural Tourism and Environmental Survey

January 16, 2001

Hello, this is [NAME] and I'm calling from the University of Georgia in Athens. We are conducting a study on tourism and environmental issues related to agriculture in the state of Georgia and your household has been randomly selected to participate in the study. Could you please answer some questions for us?

1. Yes [CONTINUE]
2. No [ARRANGE CALLBACK; APPLY PERSUADERS]

Great! In order for the results of the study to be representative of the state's population. I need to speak to the adult in your household 18 or older who last celebrated a birthday. Did you have the last birthday in your household?

1. Yes CONTINUE]
2. No [MAY I SPEAK TO THE ADULT WHO HAD THE LAST BIRTHDAY IN YOUR HOUSEHOLD?]

Before we begin, I need to let you know that all information that you provide during the interview will be kept strictly confidential. The interview is voluntary and if you don't want to answer a particular question just tell me and we'll move on to the next one. Also, my Supervisor may listen to part of the interview to be sure I'm not making any mistakes.

Now I'd like to ask you a couple of questions about some things you might do for recreation and leisure.

Q1 - Have you or members of your household ever gone on an outing to pick fruit or vegetables, sightsee, see farm animals, or otherwise take advantage of a farm environment for recreation and leisure?

1. Yes
2. No

7 - Refused
8 - Don't Know
9 - Not Ascertained

Q2 - Would you say it is very likely, somewhat likely, not very likely, or not at all likely that you or your family might visit a farm sometime in the future to pick fresh fruit or vegetables?

1. Very Likely
2. Somewhat Likely
3. Not Very Likely
4. Not at all Likely

7 – Refused
8 - Don't Know
9 - Not Ascertained

Q3 - Would you say it is very likely, somewhat likely, not very likely, or not at all likely that you or your family might visit a farm to enjoy its environment (for example, things like viewing country scenery, viewing farm animals, learning more about farming methods, or experiencing and gaining an appreciation for farm values and lifestyle?

1. Very Likely
2. Somewhat Likely
3. Not Very Likely
4. Not at all Likely

7 – Refused
8 - Don't Know
9 - Not Ascertained

For each of the following activities, please tell me how important each activity would be to you if you were to visit a farm for the primary purpose of enjoying leisure activities.

Q4a - Picking fresh farm produce (Would this be very important, somewhat important, not very important, or not at all important to you if you visited a farm for leisure?

1. Very Important
2. Somewhat Important
3. Not Very Important
4. Not at All Important

7 – Refused
8 - Don't Know
9 - Not Ascertained

Q4b - Viewing country scenery (How important would that be)

1. Very Important
2. Somewhat Important
3. Not Very Important
4. Not at All Important

7 – Refused
8 - Don't Know
9 - Not Ascertained

Q4c - See or study farm animals

1. Very Important
2. Somewhat Important
3. Not Very Important
4. Not at All Important

7 – Refused
8 - Don't Know
9 - Not Ascertained

Q4d - Learn more about farming methods

1. Very Important
2. Somewhat Important
3. Not Very Important
4. Not at All Important

7 – Refused
8 - Don't Know
9 - Not Ascertained

Q4e - Experiencing and gaining an appreciation for farming values and lifestyles

1. Very Important
2. Somewhat Important
3. Not Very Important
4. Not at All Important

7 – Refused
8 - Don't Know
9 - Not Ascertained

Q5 - How far would you travel from your residence to pick fresh produce including fruits, vegetables, etc.?

[INTERVIEWER: BEGIN WITH RESPONSE 2 AND READ EACH RESPONSE: IF R SAYS ‘YES,’ GO TO THE NEXT ONE - WHEN R SAYS 'NO', CODE THE LAST ‘YES’ RESPONSE. IF R SAYS YES TO 2 - 8, THEN ASK 9AND RECORD RESPONSE GIVEN IN MILES]

1. 0 miles (would not travel to pick fruit at a farm)
2. Would you travel 1 - 4 miles?
3. Would you travel 5 - 9 miles
4. Would you travel 10 - 19 miles
5. Would you travel 20 - 29 miles
6. Would you travel 30 - 49 miles
7. Would you travel 50 - 69 miles
8. Would you travel 70 - 99 miles
9. What is the greatest distance you would travel to pick fresh fruit at farm? [enter response in miles] _____

10 - Refused
11 - Don't Know
12 - Not Ascertained

Q6 - How far would you travel from your residence to spend time at a farm to enjoy its environment (for example, viewing country scenery, viewing farm animals, learning about farming methods, experiencing and gaining an appreciation for farm values, lifestyles)?

1. 0 miles (would not travel to pick fruit at a farm)
2. Would you travel 1 - 4 miles?
3. Would you travel 5 - 9 miles
4. Would you travel 10 - 19 miles
5. Would you travel 20 - 29 miles
6. Would you travel 30 - 49 miles
7. Would you travel 50 - 69 miles
8. Would you travel 70 - 99 miles
9. What is the greatest distance you would travel to spend time a farm to enjoy its environment? [enter response in miles] _____

10 - Refused
11 - Don't Know
12 - Not Ascertained

Q7 - Do you personally feel that visiting a farm has educational benefits?

1. Yes
2. No

7 - Refused
8 - Don’t Know
9 - Not Ascertained

Q8 - If a guide or outfitting service were available in Georgia that could provide access to recreational opportunities (such as, hunting, fishing, camping, hiking, bike riding, canoeing, bird watching, horseback riding) to you in a rural setting, would you use it?

1. Yes [SKIP TO Q8.2]
2. No

7 – Refused [SKIP TO Q8.2]
8 – Don’t Know[SKIP TO Q8.2]
9 – Not Ascertained [SKIP TO

Q8.2]

Q8.1 – Why not? (Why wouldn't you use a guide or outfitting service?}

1. Enter Response _____

7 – Refused
8 – Don't Know
9 – Not Ascertained

[SKIP TO Q13]

Q8.2 - What activities would you be interested in pursuing?

[INTERVIEWER: DO NOT READ RESPONSES, CODE ALL THAT APPLY]

1. Hunting
2. Fishing
3. Camping
4. Hiking
5. Bike Riding
6. Canoeing
7. Bird watching
8. Horseback Riding
9. Other _____ (SPECIFY)
10. Refused
11. Don't Know
12. Not Ascertained
13. Exit

Q9 - What is the maximum number of <u>one-way</u> miles you would travel to use a guide or outfitting service such as this?

_____ Miles

995 – 995+ miles
997 – Refused
998 – Don't Know
999 – Not Ascertained

[PROGRAMMER NOTE: RANGE 1 – 999]

Q10 - How many times a year would you use this guide or outfitting service?

_____ Times

95 – 95+ times
97 – Refused
98 – Don't Know
99 – Not Ascertained

[PROGRAMMER NOTE: RANGE 1 – 99]

Q11 - How many days would you stay each time you went?

_____ Days

95 – 95+ days
97 – Refused
98 – Don't Know
99 – Not Ascertained

[PROGRAMMER NOTE: RANGE 1 – 99]

Q12 - Assuming high quality guide or outfitting service is provided, what is the highest fee you would pay to the provider of the recreational service for each occasion you used the service for each of the activities below?

[INTERVIEWER NOTE: IF R IS NOT WILLING TO PAY ANYTHING, CODE "0"
BE SURE TO CODE AN ANSWER FOR EACH RESPONSE.
USE WHOLE NUMBERS ONLY
USE 9995 FOR $9995+
USE 9997 FOR REFUSED
USE 9998 FOR DON'T KNOW
USE 9999 FOR NOT ASCERTAINED]

Q12.1 $ _____ Hunting
Q12.2 $ _____ Fishing
Q12.3 $ _____ Camping
Q12.4 $ _____ Hiking
Q12.5 $ _____ Bike Riding
Q12.6 $ _____ Canoeing
Q12.7 $ _____ Bird watching
Q12.8 $ _____ Horseback Riding
Q12.9 $_____ Other: [SPECIFY ACTIVITY AND AMOUNT_____]

[PROGRAMMER NOTE: RANGE 0 – 9999]

Q13 - How would you classify your current residence? Check one.

1. Farm
2. Rural, not farm
3. Small town (up to 4,000 people)
4. Medium Town (4,001-10,000 people)
5. Large Town (10,001-25,000 people)
6. Medium-size city (25,000-50,000 people)
7. A Large city/Metro Area (50,000+ people)
8. Refused
9. Don't Know
10. Not Ascertained

Q14 - How would you classify where you grew up? Check one.

1. Farm
2. Rural, none farm
3. Small town (up to 4,000 people)
4. Medium Town (4,001-10,000 people)
5. Large Town (10,001-25,000 people)
6. Medium-size city (25,000-50,000 people)
7. A Large city/Metro Area (50,000+ people)
8. Refused
9. Don't Know
10. Not Ascertained

Q15 - What percentage of your income is derived from farming?

ENTER PERCENTAGE: _____

101 – Refused
102 – Don't Know
103 – Not Ascertained

[PROGRAMMER NOTE: RANGE 0 – 103]

Q16 - About how many miles from your home is the closest farm with animals such as hogs, poultry, or cattle?

[INTERVIEWER NOTE: RECORD "0" FOR FARM RESIDENT IF RESPONDENT LIVES ON A FARM THAT HAS ANIMAL OPERATIONS.]

Number of miles _____

95 – 95+ miles
97 – Refused
98 – Don't Know
99 – Not Ascertained

[PROGRAMMER NOTE: RANGE 0 – 99]

Now I'm going to read you some statements regarding animal agriculture. For each statement, please tell me if you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree. Please remember that we will maintain the confidentiality of your responses.

Q17 - Animal agriculture is important to the economy in the <u>county</u> where I live.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q18 - Farmers with small livestock operations do a much better job of protecting the environment than do farmers with large livestock operations or corporate farms.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q19 - Policy makers in this state are knowledgeable about animal agriculture.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q20 - Animal agriculture has negative effects on property values.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q21 - Family-run animal operations should be supported even if it means higher food prices.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q22 - Large animal operations get too much assistance from government programs.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q23 - Farm animal wastes significantly harm water quality.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q24 - Animal agriculture raises serious ethical questions about the treatment of animals.

1. Strongly agree
2. Agree
3. Neither agree nor disagree [SKIP TO Q25]
4. Disagree [SKIP TO Q25]
5. Strongly disagree [SKIP TO Q25]

7. Refused [SKIP TO Q25]
8. Don't Know [SKIP TO Q25]
9. Not Ascertained [SKIP TO Q25]

Q24.1 Whose responsibility is it to do something about these ethical concerns?

1. Enter Response _____

7. Refused
8. Don't Know
9. Not Ascertained

Q24.2 Do you ever avoid some-meats or-meat products because of ethical concerns?

1. Yes
2. No [SKIP TO Q25]

7. Refused
8. Don't Know
9. Not Ascertained

Q24.3 Which one(s)?

1. Enter Response _____

7. Refused
8. Don't Know
9. Not Ascertained

Q25 - It would be better to use land currently used for animal agriculture for residential, manufacturing or business purposes.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

7. Refused
8. Don't Know
9. Not Ascertained

Q26 - It would be better to use land currently used for animal agriculture for parks, open space or other natural purposes.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

7. Refused
8. Don't Know
9. Not Ascertained

Q27 - Environmentalists exaggerate problems associated with animal agriculture.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q28 - Today's meats and meat products are safer than they ever have been.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q28.1 Do you avoid some meats or meat products because of safety concerns?

1. Yes
2. No [SKIP TO Q29]
7. Refused [SKIP TO Q29]
8. Don't Know [SKIP TO Q29]
9. Not Ascertained [SKIP TO Q29]

Q28.2 Which one(s)?

1. Enter Response _____

7. Refused
8. Don't Know
9. Not Ascertained

Q29 - We need tougher environmental regulations around animal operations.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q30 - In my county, animal agriculture is a respected and acceptable business and way of life.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q31 - In my county, animal agriculture contributes to air pollution.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q32 - Animal agriculture has reduced the quality of life for me.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q33 - Farmers should share in the cost of cleaning up water contaminated by animal waste.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q34 - Generally speaking, environmental groups know enough about animal agriculture and can effectively propose well reasoned policies regarding regulation of animal operations.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q35 - How much more are you willing to pay for meats and meat products certified to have been grown and produced in ways that do not pollute the water? Would you be willing to pay between 1 and 9% more, 10 to 15% more, 16 to 25% more, 26 to 40% more, 41 to 50% more, 51 to 75% more, between 76 and 100% more, or more than twice as much?

1. 1 - 9%
2. 10 - 15%
3. 16 - 25%
4. 26 - 40%
5. 41 - 50%
6. 51 - 75%
7. 76 - 100%
8. More than twice as much

9. I am not willing to pay more than I already am.
10. Refused
11. Don't Know
12. Not Ascertained

Q36 - Property owners have the right to do with their property what they wish.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q37 - In certain circumstances, zoning or environmental regulations are needed to protect individual and community health and well-being.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q38 - It is important that family farms be preserved.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q39 - Corporate animal operations should not be permitted to operate in Georgia.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q40 - Corporate farms are driving family farms out of business.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q41 - Contract operations (poultry and hog processors who contract with growers to produce animals for their processing plants) should share in the cost of cleaning up water contaminated with animal waste.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q42 - Government policies should focus on making small animal operations more efficient.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q43 - Animal agriculture is a real nuisance because of the odor.

6. Strongly agree
7. Agree
8. Neither agree nor disagree
9. Disagree
10. Strongly disagree
7. Refused
8. Don't Know
9. Not Ascertained

Q43.1 In your opinion, which types of animal operations cause the most odor problems?

1. Enter Response _____

7. Refused
8. Don't Know
9. Not Ascertained

Q43.2 Have you ever been bothered by the odor of animal operations?

1. Yes
2. No [SKIP TO Q44]
7. Refused [SKIP TO Q44]
8. Don't Know [SKIP TO Q44]
9. Not Ascertained [SKIP TO Q44]

Q43.3 What type of operation was it?

1. Enter Response _____

7. Refused
8. Don't Know
9. Not Ascertained

Q43.4 How long ago was this?

1. Enter Response _____

7. Refused
8. Don't Know
9. Not Ascertained

Q44 - Given the potential for animal operations to cause odors, animal agriculture operations in my county are not worth it economically?

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

7. Refused
8. Don't Know
9. Not Ascertained

Q45 - I am willing to support additional animal agriculture in my county.

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

7. Refused
8. Don't Know
9. Not Ascertained

Q46 - Do you currently own a farm or ranch ?

1. Yes
2. No

7. Refused
8. Don't Know
9. Not Ascertained

Q47 - Do any of your close friends or relatives own a farm or ranch?

1. Yes
2. No

7. Refused
8. Don't Know
9. Not Ascertained

Q48 - How familiar are you with farms that have animal operations?

1. Not at all familiar
2. Know a little bit
3. Have some experience
4. Am Quite Knowledgeable
5. Am (or have been) directly involved.

7. Refused
8. Don't Know
9. Not Ascertained

We're almost finished with the interview, but for statistical purposes. I need to ask you a few questions about you personally. Please keep in mind that all of the information will be kept confidential.

Q49 - First, are you a native Georgian or did you move to Georgia from another state?

1. Native of Georgia [SKIP TO Q51]
2. Moved to Georgia
7 – Refused
8 - Don't Know
9 - Not Ascertained

[CATI PROGRAMMER: 7, 8, 9 CONTINUE TO Q50]

Q50 - Which state were you raised in?

[INTERVIEWER NOTE: IF R SPENT CHILDHOOD/ADOLESCENCE IN SEVERAL STATES, ASK, "In which state would you say you lived the longest before the age of 18"?]

1. Alabama
2. Alaska
3. Arizona
4. Arkansas
5. California
6. Colorado
7. Connecticut
8. Delaware
9. District of Columbia
10. Florida
11. Georgia
12. Hawaii
13. Idaho
14. Illinois
15. Indiana
16. Iowa
17. Kansas
18. Kentucky
19. Louisiana
20. Maine
21. Maryland
22. Massachusetts
23. Michigan
24. Minnesota
25. Mississippi
26. Missouri
27. Montana
28. Nebraska
29. Nevada
30. New Hampshire
31. New Jersey
32. New Mexico
33. New York
34. N. Carolina
35. N. Dakota
36. Ohio
37. Oklahoma
38. Oregon
39. Pennsylvania.
40. Rhode Island.
41. S. Carolina
42. S. Dakota
43. Tennessee
44. Texas
45. Utah
46. Vermont
47. Virginia
48. Washington
49. W. Virginia
50. Wisconsin
51. Wyoming
97 - Refused
98 - Don't Know
99 - Not Ascertained

Q51 - About how many years have you lived in Georgia?

[INTERVIEWER: IF RESPONDENT SAYS, "All my life" or don't know". probe for exact number of years with. "How many years is that". or "Could you give me your best guess"'?

_____ years

95 - 95 or more
97 - Refused
98 - Don't Know
99 - Not Ascertained

[RANGE 0 – 99]

Q52 - What is your age'?

95 - 95 or older

_____ years old

97 - Refused
98 - Don't Know
99 - Not Ascertained

[RANGE 18 – 99]

Q53 - What race do you consider yourself to be?

[INTERVIEWER: DO NOT READ RESPONSES; CODE RESPONSE]

1. White
2. Black (African-American)
3. Asian
4.Hispanic
5. Multi-racial [SPECIFY]

7 - Refused
8 - Don't Know
9 - Not Ascertained

Q54 - GENDER [ask only if unsure]

1. Male
2. Female

7 - Refused
8 - Don't Know
9 - Not Ascertained

Q55 - What is your marital status? Are you married, divorced, separated, widowed, or single?

1. Married
2. Divorced
3. Separated
4. Widowed
5. Single

7 - Refused
8 - Don't Know
9 - Not Ascertained

Q56 - What is the highest grade of school or year of college you have completed?

(INTERVIEWER: DO NOT READ RESPONSES; PROBE FOR EXACT YEARS AND CODE RESPONSE]

1. None
2. 1 - 8 years
3. 9- 11 years
4. High School Diploma GED
5. Some college/technical school, no degree
6. 2 year degree
7. Bachelors Degree
8. Some graduate work
9. Advanced Degree, Professional Degree

10 - Refused
11 - Don't Know
12 - Not Ascertained

Q57 - Are you registered to vote?

1. Yes
2. No

7 - Refused
8 - Don't Know
9 - Not Ascertained

Q58 - And finally, what was your total household income (before taxes) last year. I don't need an exact figure, just an approximate category, so could you tell me whether your total family income for last year was .....

Above or below

<START HERE>

1. $4,999 or less
2. $5,000 - $9,999
3. $10,000 - $14,999
4. $15,000 - $19,999
5. $20,000 - $24,999
6. $25,000 - $29,999
7. $30,000 - $34,999
8. $35,000 - $49,999
9. $50,000 - $74,999
10. $75,000 or more

11 -Refused
12 - Don't Know
13 - Not Ascertained

That's all the questions I have for you today. Thank you so much for your time.