THE ROLE OF INFORMATION IN MAIL CONTINGENT VALUATION SURVEYS: A STUDY ESTIMATING WILDLIFE BENEFITS

by

Kurt Stephenson

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APPROVED:

Daniel B. Taylor, Chairman

Leonard A. Shabman

Roy L. Kirkpatrick

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Blacksburg, Virginia

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(ABSTRACT)

The contingent valuation method has been used with increasing frequency to estimate the value of nonmarket goods such as wildlife. Increasing use of and demand for the method has lead to the increased use of mail surveys to collect value information. The mail format, however may place limitations the method's ability to generate acceptable value estimates. This study examined the effects of various amounts of information in the hypothetical market created in mail contingent valuation surveys.

The problem setting used to examine the information problem was the current controversy surrounding the pesticide carbofuran. This pesticide has some negative impacts on wildlife, most noticeably the bald eagle. Within this context, four different mail surveys were designed and mailed to Virginia residents. Each survey contained different amounts of information on the affects of carbofuran on wildlife. The impact of information on response rates, willingness to pay bids, and aggregate benefit estimates was then examined. The findings suggested that mail surveys with lengthy and complex contingent scenarios may tend to be less effective for commodities where respondents have had previous experiences analogous to those presented in the hypothetical market.

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CHAPTER 1

1.1 Introduction

In the 1960's many people began to question the nation's emphasis on economic growth and development without regard to the effects of pollution, intrusion into dwindling wilderness areas, and disruption of ecosystems. The emerging environmental movement highlighted the growing trade-offs between unchecked economic growth and environmental decay. The new environmental awareness lead to the United States government's creation of the Environmental Protection Agency (EPA) in December 1970. The main objective of the EPA was to protect citizens' water, air, land and other natural resources from abuse. In addition to concern over clean air and water, many individuals became increasingly active in preserving endangered wildlife species and maintaining ecological balance. Many wildlife species like the grizzly bear, bald eagle, and bighorn sheep were classified as threatened or endangered species and were protected by law. By the end of the 1970's the environmental movement had consolidated significant political, social and economic influence, which remains intact today.

The environmental movement promulgated many controversies over issues such as the snail darter and the Telico Dam, energy and mineral development in the West and Alaska, and the effect of air pollution from energy plants on scenic western recreational sites, to name but a few. Economists felt the need to systematically measure various trade-offs associated with these controversies within the traditional benefit-cost analysis. Problems arose, however, in attempts to measure "goods" like clean air, water, loss of a scenic valley, or disruption of a unique ecosystem. Along with these environmental amenities, wildlife species belong to a group of natural resources that falls outside the pricing mechanism of the market.

Economists have attempted to bring these nonmarket resources such as free roaming wildlife species, into the realm of economic valuation on a comparative footing with market goods. For a complete assessment of the benefits and costs of a proposed project, it is essential to value both market and nonmarket goods. Several techniques have been derived to estimate the value of nonmarket goods. Two frequently used indirect methods include the travel cost and hedonic methods which use prices of market goods to reveal values of nonmarket goods (see Appendix A). The hedonic technique derives the value of a nonmarket good from information that is embedded in the price of a market good. Some goods exchanged in the market possess certain distinct characteristics. For example, property values are determined by many factors, such as the physical characteristics of the property, location (rural or nonrural), school system, neighborhood, or in the case of many cities, air quality. In the case of clean air, air quality differences may be reflected in different property values (Brookshire, Thayer, Schulze, and d'Arge, 1982). Because related markets do not normally exist for wildlife species, the hedonic technique has only limited applicability in the area of wildlife valuation. There are, however, some markets in many parts of the country that buy and sell the right to hunt wildlife. Within such markets value can be derived for the hunted wildlife species. For example, a recent study estimated the value of the white-tailed deer from the sale of hunting leases in Texas (Livengood, 1983).

The travel cost method estimates the value of a recreation site, such as a wilderness area, by using variable expenditures (i.e. travel costs). Estimating travel costs for consumers visiting a recreation site from various distances will yield a site demand curve. Travel cost is a widely used method for valuing many nonmarket resources because value is derived from actual market behavior. The travel cost method has not been used extensively, however, to estimate the value of individual wildlife species. Once the value of a recreation site is estimated, the researcher has difficulty separating the components that make up the site value. In addition, other more general limitations exist (Stoll, 1983). A particularly unique recreation site, such as the Grand Canyon, will yield skewed results. Multipurpose trips and measuring what actually constitutes travel costs are also lead to problems in implementing the travel cost method. Recent developments have combined the travel cost and hedonic models thereby, making valuation of a particular species through travel costs possible (Brown and Mendelsohn, 1984).

Contingent valuation is a direct method of valuing wildlife species because value information is obtained directly from individual responses to contingent circumstances set up in a hypothetical market. A survey, administered either by mail, telephone or personal interview, is used to reveal an individual's preferences. Value is derived directly from the survey. The contingent valuation method (CVM) is easy to apply relative to other techniques and has been used to estimate the value of many wildlife species (Hammack and Brown, 1974; Brookshire, Randall, and Eubanks, 1983; Stoll and Johnson, 1984; Samples, Dixon, and Gowen, 1986). Taken as a whole these nonmarket valuation methods provide economists with tools to provide nonmarket goods comparable footing with market goods in economic analysis.

1.2 Problem Statement

The contingent valuation method is flexible and is capable of assigning benefit estimates to a wide variety of nonmarket goods. For some nonmarket goods, the CVM is the appropriate method for generating benefit estimates. Although the CVM possesses wide applicability and is consistent with mainstream neoclassical consumer theory, potential limitations or biases exist. Major biases identified in the literature include hypothetical bias; inaccurate responses due to the hypothetical situation posed in the survey; strategic bias, which occurs if respondents purposefully reveal inaccurate preferences to influence the outcome of the study; and an information problem, which occurs when the amount and/or the complexity of information provided in the survey influences responses.

This study examined the information problem. The role information plays in CVM is not well understood, and may present some serious limitations to the method. Researchers are unclear, for instance, whether the quality and quantity of information influences an individual's value estimates, and thus influences aggregate benefit estimates. Debate continues on what constitutes an appropriate amount of information. (Bergstrom and Stoll, 1987; Boyle, 1988; Samples, Dixon and Gowen, 1986).

In mail contingent surveys, there also may exist a trade-off between the complexity of the contingent market and the ability of respondents to understand the description. Mail contingent surveys must rely on the respondents ability to read and understand the description of the hypothetical market. Some researchers, for instance, point to the low reading levels of many Americans (Mitchell and Carson 1987a). The problem is to be able to describe complex problems in sufficient detail without damaging the ability of a mail contingent valuation survey to elicit valid benefit estimates.

1.3 Objectives

The objectives of this thesis are as follows:

1) To evaluate the role information plays in mail contingent valuation surveys by

A) evaluating the impact of information on response rates,

B) evaluating the impact of information on the magnitude and reliability of individual value estimates, and

C) evaluating the impact of information on aggregate benefit estimates from the contingent valuation surveys.

1.4 Summary of Procedures and Data

Four different surveys were used to examine the role of information in mail contingent valuation surveys. Statistical tests were used to evaluate whether or not the amount of information about the hypothetical market affects the results of contingent valuation surveys. For each of these four surveys, benefit estimates were elicited from Virginia residents for a ban on carbofuran.

CHAPTER 2. Conceptual Framework

2.1 Introduction

In the neoclassical framework, economic value or benefit stems from the notion of scarcity and trade-offs. A limited budget allows an individual to acquire a good or service only by sacrificing some other good. Dollar votes are used to measure the sacrifice made by individuals. Value therefore is reflected by consumers' willingness to sacrifice or forego dollars for the use of a good or service. In private, competitive, well functioning markets, value is determined by the interaction of supply and demand. When markets are in equilibrium and quantity changes are marginal, marginal value is measured by the price of the product. Thus, value is revealed directly in the market.

The problem however is that the market is not always functioning well enough to allow for such a simple estimation of economic value. Nonmarginal changes and interferences with the operation of competitive, well functioning markets will result in distorted valuation. Two common sources of market failure in the natural resource area, for example, result when goods are classified either as nonexclusive or nonrival (see Randall, 1987, for a discussion of these concepts).

Wildlife and other resources that are subject to either of these two types of market failure cannot be properly valued in the traditional market framework. Nonmarket goods may possess a great deal of social value that will not be revealed in the market place. Economists have attempted to value nonmarket resources and place them on equal footing with market goods through the concept of consumer surplus.

2.2 Consumer Surplus

Social value or net benefit begins with the notion of consumer surplus.[1] Consumer surplus measures the total economic worth of a resource to society as the sum of the maximum amount individuals are willing to pay for some level of the resource. Freeman (1979a, p.34) describes consumer surplus as "the money measure of the gains and losses in utility and welfare associated with changes in the individual's economic circumstances". This total benefit or value is measured as the area under a demand curve and above the price line which is the value the consumer derives over what is paid. In Figure 1, P represents the price of the good, and the area PBQO represents the total dollar amount spent on Q quantity of good X. The area PAB is the consumer surplus or total benefit that the consumer derives from Q amount of good X.

There are five different measures of consumer surplus. The first is Marshallian or ordinary consumer surplus which is defined as the area under an ordinary demand curve. An ordinary demand curve is a function of both prices and money income. The Marshallian demand function does not maintain a constant level of utility due to the income effect. Because there is no specific utility level, the Marshallian measure is only an approximate measure of welfare change (Willig, 1976; Randall and Stoll, 1980).

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[1] It must be noted that consumer surplus is not a neutral concept, but implicitly assumes the existence of a set of property rights to the commodity valued.

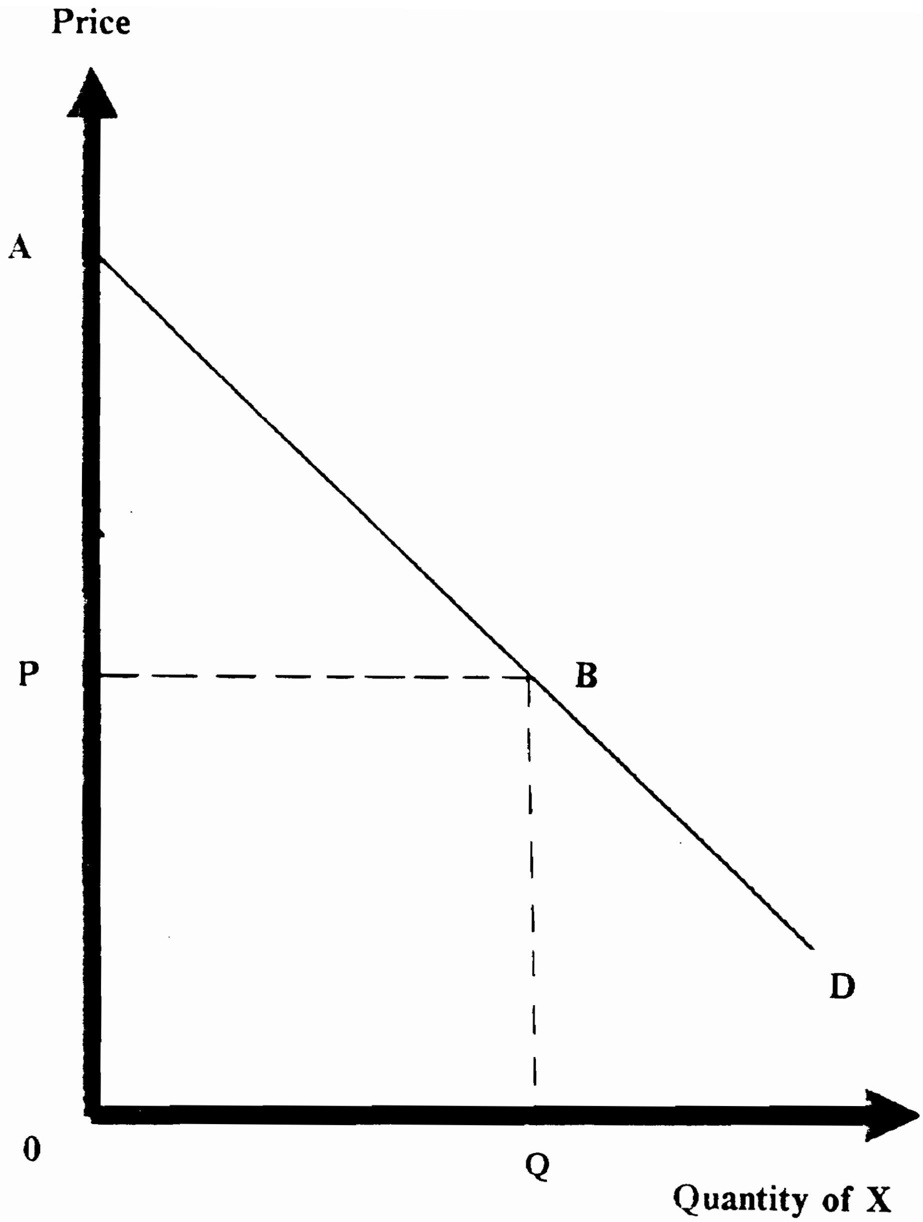

Figure 1

Consumer Surplus

The theoretically correct measure of welfare change is derived from the Hicksian demand function which accounts for only the substitution effects of a price or quantity change. Moving along any Hicksian demand curve, utility is held constant. There are four Hicksian measures of consumer surplus: compensating variation, equivalent variation, compensating surplus, and equivalent surplus. The variation and surplus measures differ to the extent that individuals are able to make optimal adjustments in their consumption bundles after a price or quantity change. The variations approach permits optimal adjustments in quantity consumed after a welfare change whereas the surplus measure does not allow the individual to make optimizing adjustments in quantity consumed after a welfare change. For example, a surplus measure would be used if a project once built could only be provided in a fixed quantity, that is no consumer can adjust the quantity of the resource within his own consumption bundle, whereas the variation measure would be used if the opposite were the case.

Compensating and equivalent measures differ in the reference level of welfare. Compensating measures can be defined as the compensation, paid or received, which would leave the consumer in his initial welfare position following a welfare change. The assumption for compensating measures is that the consumer has the "right" to his original welfare position. For instance, assume that an individual is faced with a proposed decrement in some current level of a wildlife amenity. A compensating measure of this welfare change would be the payment in income necessary to make the individual indifferent to the proposed decrement. Note the implicit assumption of the compensating measure is that the individual has the "right" to the initial level of the wildlife amenity and must be compensated to give up the good. The equivalent measure is the payment required to leave the consumer in his subsequent welfare position without a welfare change. The equivalent measure assumes that the consumer does not own the right to the original welfare position but rather has the right to the welfare level after a price or quantity change. Again consider a proposed decrement in some wildlife amenity. The equivalent measure would be the amount of income the individual would be willing to give up to avoid the change in the level of the wildlife amenity. The individual has no right to the current level of provision, since he must allocate income to avoid the threatened decrement. Within the benefit-cost framework, the compensating measure is consistent with the Pareto improvement criterion and is considered the appropriate welfare measure[2].

Consumer surplus can also be interpreted as an individual's willingness to pay (WTP) and willingness to accept (WTA) welfare change. Within this context compensating measures of welfare change are the amount an individual is willing to pay, WTP^c, for an increment in quantity and willingness to accept compensation, WTA^c, for a decrement. These measures are equal to the area under the appropriate Hicksian compensated demand curves. Equivalent measures of welfare change are the amount an individual is willing to pay, WTP^e to avoid a decrement in quantity and willingness to accept, WTA^e, compensation if a promised increment is not provided.

Although welfare change usually is represented as price changes, in the area of natural resources many changes involve changes in bundles of goods (Randall and Stoll, 1980). For example a proposed wildlife conservation program would initially only change a consumer's level of wildlife enjoyment, leaving prices unaffected. To conceptually link the various benefit measures with quantity change consider the indifference mapping in Figure 2 (Randall and Stoll 1980). Initially assume X is a divisible good traded in large markets with no transaction costs. This defines the Hicksian variation measure because consumers are able to make costless optimizing adjustments after a quantity change. The consumer's initial welfare position is point E. Here the consumer has attained the highest level of utility (represented by indifference curve I^3) given the budget constraint Z. Indifference curve I^3 is tangent to the budget line at point E. On the vertical axis Y represents a numeraire for all other goods excluding X. Now consider a proposed decrement that would reduce an individual's holdings of good X from Q^3 to Q^1. The consumer is initially thrown to point C, consuming the same initial level of the numeraire, Y^e, but now only consuming Q^1 of the good X. Due to the costless transactions assumption, the individual will trade the numeraire for X until an indifference curve is tangent to the new budget line Z^1. The new budget line represents the decreased value of the individual's holdings (budget). The new equilibrium point is D. The equivalent variation measure of the welfare loss, WTP^e, is the amount EF which is the same as

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2 The Pareto improvement criterion is one of the foundations on which benefit-cost analysis rests. Pareto improvement is a change that makes at least one person better off without making any one else worse off.

Y^1Y^2 . The line EF is the amount of the numeraire that the individual would be willing the sacrifice to avoid the decrement in X. The compensating variation measure, WTA^c, is the amount the individual would have to be compensated to be indifferent to the proposed decrement and is equal to BC or simply Y^1Y^2. That is under the assumption of frictionless adjustments WTP and WTA are equal (Randall and Stoll, 1980). For a proposed increment in Q with the same assumptions the appropriate compensating and equivalent measures of welfare change, WTP^c and WTA^e, could also be illustrated.

Now assume that the consumer is unable to adjust his consumption set after the decrement in Q. Good X is then defined as a "lumpy" or an indivisible good with positive transactions costs. Under these conditions, Hicksian surplus measures, not variations, are used to measure welfare change. A decrement in Q, from Q^3 to Q^1, will now lead to WTP^e of the amount EG or $Y^e\ Y^g$. WTA^c is equal to the amount CA or Y^eY^a. For decrements of indivisible goods with positive transactions costs, WTP^e is smaller in value than WTA^c. Again for a proposed increment, the appropriate compensating and equivalent measures of welfare change would be WTP^c and WTP^e. Randall and Stoll (1980) provide rigorous bounds on WTP and WTA measures for quantity changes.

As noted above, the compensating measures of welfare change, WTP^c and WTA^c, are generally considered the appropriate measures of welfare change. In many instances however, value data is most readily attainable in the equivalent forms, particularly WTP^e. For valuing decrements in some wildlife population, the use of WTP^e may be more realistic than WTA^c. In general WTP^e will be equal to WTP^c, both theoretically and empirically (Brookshire, Randall and Stoll, 1980).

Various techniques have been developed to quantify welfare change for nonmarket resources: hedonic pricing, travel cost, and contingent valuation methods (see Appendix A for a review of travel cost and hedonic methods). The technique of interest in this study is the contingent valuation method (CVM). The following sections of this chapter will outline the theoretical and conceptual framework for the CVM.

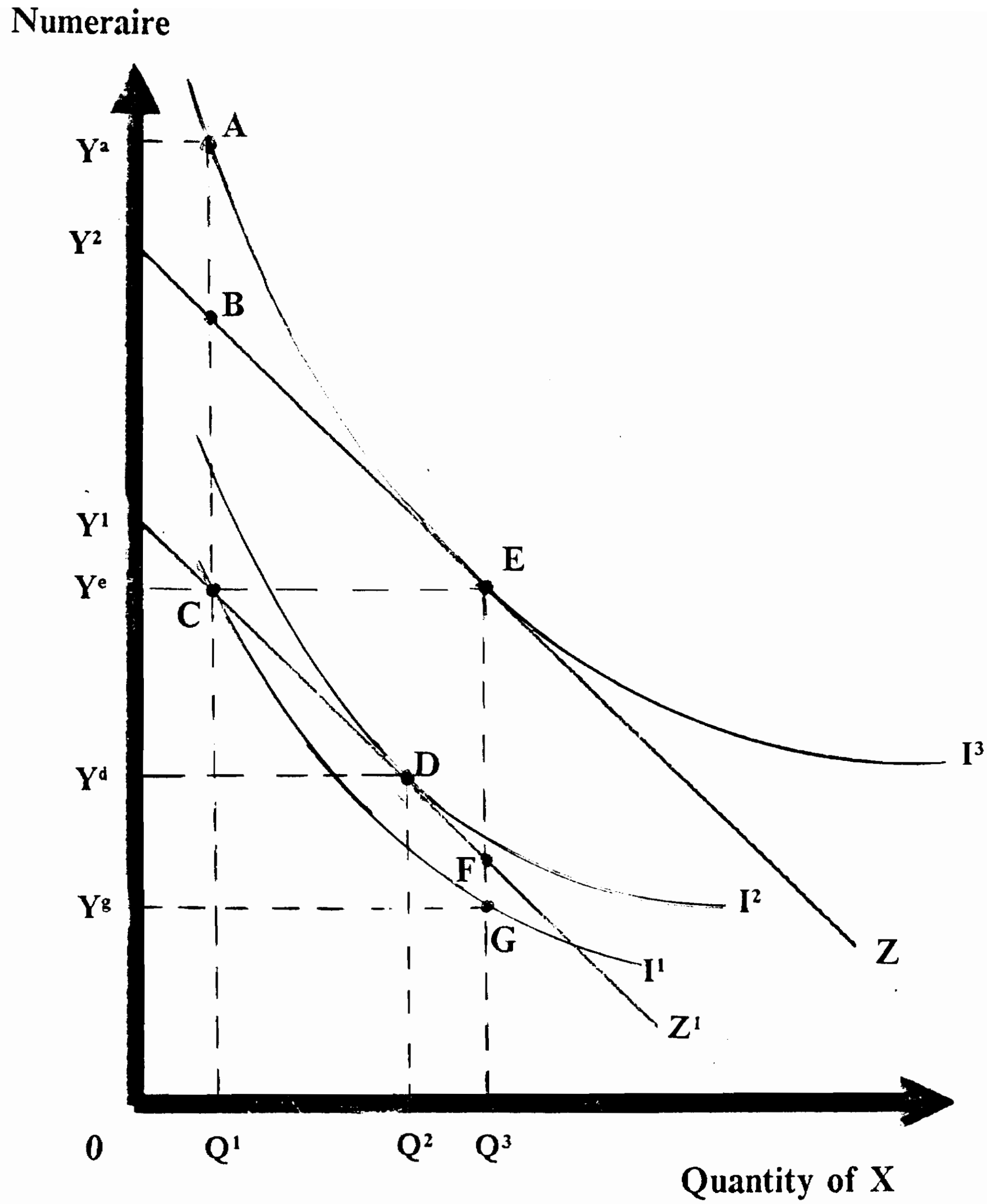

Figure 2

The Welfare Impact of a Change in the Quantity of Good X From Q^3 to Q^1

SOURCE: RANDALL AND STOLL (1980)

2.3 *The Contingent Valuation Method*

The contingent valuation method (CVM), developed by Davis (1963), derives benefit information directly from the individual through a survey instrument. Hypothetical situations or markets are presented to the individual who is asked to respond with WTP and WTA information. The CVM has been used to estimate wildlife values in a number of studies (Hammack and Brown, 1974; Brookshire, Eubanks, and Randall, 1983; Samples, Dixon, and Gowen, 1986; Boyle and Bishop, 1986; Stoll and Johnson, 1984; and Bishop and Heberlein, 1979).

The CVM begins with the following indirect utility function:

(1) $$U_0 = u(Q_0, P, Y),$$

where:

Y = Income,

P = Vector of prices for market goods, and

Q_0 = The initial level of some wildlife amenity.

Suppose now that there is a threatened decrement in the level of Q from Q_0 to Q_1. A individual would be willing to offer a bid, WTP^e, by the amount B in order to avoid the change:

(2) $$u_1(Q_1,P,Y) = u_1(Q_0,P,Y - B).$$

Likewise the individual would be willing to accept compensation WTP^c for the proposed decrement by the amount C:

(3) $$u_0(Q_0,P, Y) = u_0(Q_1,P, Y + C).$$

Calculating a demand curve with the CVM is unnecessary, as welfare change is obtained directly from the individual through C and B.

It can be shown using the theoretical formulation similar to Willig (1976) and Randall (1985) that WTP and WTA in equations (2) and (3) are theoretically identical to the other nonmarket valuation methods, the hedonic and travel cost. WTP and WTA for both the indirect and contingent methods are equal to areas under compensated Hicksian demand curves.

The CVM relies on a survey instrument, either through a personal interview, mail, or telephone, interview, to acquire WTP and WTA information. A hypothetical scenario or contingent situation is presented to the individual to reveal his preferences. In essence a market is created for the nonmarket good and the individual is asked to value the good within that context. Benefit estimates are thus derived directly from the individual. Due to the hypothetical nature of the method, the survey presented to the respondent should be made as realistic and credible as possible. The survey should involve the respondent's learned or routine behavior and focus on concrete situations (Randall, Ives, and Eastman, 1974). A hypothetical payment vehicle, a proposed tax or licence fee for example, is often used to gather WTP information. The payment vehicle should also be familiar and recognizable to the respondents. In short the survey and the hypothetical market should be made as believable and realistic as possible.

A certain amount of information is needed to set up and describe the hypothetical market. Enough information needs to be provided to describe all important features of the commodity and market in order to minimize ambiguity and to ensure all respondents will uniformly understand the contingent scenario. On the other hand excessive information may damage the results of the survey process, by confusing the individual, or leading to a decreased response rate.

There are various factors to consider when choosing the type of survey to gather benefit estimates. Neither of the three methods, mail, telephone, or personal interview are without limitations. Generally mail surveys are the most inexpensive way to gather information, followed by telephone surveys. Although the personal interview is the most expensive method, it is thought to produce the best overall results (Mitchell and Carson, 1987a), The presence of an interviewer increases the amount of thought given to each question, respondent motivation, and response rates. Motivation is particularly important in contingent valuation surveys due to the unfamiliarity of individuals with WTP type questions. Personal interviews are also better able to handle complex contingent scenarios than mail or telephone interviews. Also, a personal interview decreases the amount of protest bids and the number of questions left unanswered. Personal interviews may be easier to implement if benefit estimates are to be generated for a relatively small, localized population. As geographic area and population size increases so do the travel costs necessary to reach the respondent. Mail surveys on the other hand are a relatively inexpensive way to reach a large population, and have been used with greater frequency in benefit estimation as the demand for and acceptance of the CVM has increased.

One of the main limitations associated with mail surveys involves the information problem. Mail surveys can not accommodate complex scenarios as easily as personal interviews. Some researchers point to the surprising low reading levels of many Americans and question the ability of mail surveys to address relatively complex problems (Mitchell and Carson, 1987b). The challenge for researchers using a mail survey is to achieve a balance between a survey that captures all essential details of the commodity being valued, but also is short and simple enough to be understood by most respondents.

2.3.1 Components of a Contingent Valuation Survey.

The essence of a contingent valuation survey lies in the construction of the hypothetical market. There are four key elements of the hypothetical market that must be constructed carefully. The hypothetical market in general should possess the essential features of an actual market situation. Several criteria suggested in the literature are as follows: the commodity must be understood clearly and be familiar to the respondents, respondents must have had prior valuation and choice experience with respect to consumption levels of the commodity, and WTP (not WTA) measures should be obtained (Cummings, Brookshire, and Schulze, 1986).

The first component of the hypothetical market is the description of the commodity to be valued. The description should be clearly worded so as to ensure uniform understanding across respondents. Respondents must value the same commodity in order for benefit estimates to be meaningful. Pretesting helps eliminate misunderstood words or phrases, and helps to better define the contingent scenario. The description also should capture all important details of the commodity. For instance, the commodity change being described must measure the change which is of interest to the the policy maker (Mitchell and Carson, 1987a).

The second component is the choice and description of how the proposed change in the commodity is going to be implemented. For example, consider a threatened decrement in an endangered species caused by increased residential development. Will the means to preserve this species be carried out by the preservation of key habitat within the species current range or is the species going to be relocated to a remote area? How the change in the commodity is going to be carried out in the hypothetical market should be related to the likely actual change in the commodity. Also the choice of how the changes will be implemented in the hypothetical market should reflect the proposal the policy maker is examining. For example, if the EPA wishes to estimate wildlife benefits stemming from a ban on various chemicals, the valuation of wildlife should be presented in the context of a ban on these chemicals. Finally, the choice of how the change is carried out should be made as realistic as possible. The more realistic, believable, and familiar the hypothetical policy is, the more likely it is that respondents will participate in the survey and reveal their true WTP.

The third component of the contingent market is the method of payment. This describes how the proposed policy is going to be funded. The payment vehicle together with the description of the commodity and how the commodity is provided define the entire contingent market. Examples of potential payment vehicles include a tax, private preservation fund, and some type of user fee, or license. The choice and design of the payment vehicle is similar to the criteria of the previous two components of the contingent market. First, the payment vehicle should be realistic, believable, and familiar to the respondent. The payment vehicle should also relate to the framework set up by the previous two components. Careful thought should be given to the choice of payment vehicle since the method of payment is likely to influence bidding patterns. A public good cannot be valued independent of the way in which society will pay for the good (Arrow, 1986; Mitchell and Carson, 1987a; and Randall, 1986). In essence then, a respondent values the entire policy, including the method of payment, and not just an increment or decrement in a commodity.

Finally, a bidding procedure is needed to gather WTP data. There are two different approaches used to derive WTP information, iterative and noniterative bidding. Iterative bidding involves the interviewer presenting a bid offer to the respondent and asking him to accept or reject the offer. If the respondent rejects the offer, the interviewer presents another bid in the direction of the respondent's held value and the respondent is asked to accept or reject the new bid. Through this process the respondent's WTP bid is found. The justification for using the iterative bidding process is to allow the respondent to make various trade-offs and to think and to reconsider his bid offers. The preferred format to administer this bidding procedure is through a personal interview.

The noniterative method asks the individual to give only one bid response. For example a question might be: "What is the maximum amount you would pay for a deer hunting license." There are two different formats the noniterative question can take, open and close-ended. Open-ended questions ask directly what the maximum an individual would be WTP. The previous example of the deer hunting license is an open-ended question. Close-ended questions ask the respondents to simply state yes or no to some preselected bid. An example of a close-ended question is "Would you be willing to pay $20 for a fishing permit?". Each bidding method should be neutral, that is the two different bidding methods should yield the same WTP responses from the same individual. Research on bidding methods is inconclusive. Some research suggest that bidding methods may significantly alter bids (Steller, Stoll, and Chavas, 1985) whereas others have found more encouraging results (Boyle and Bishop, 1988).

A payment card is a variation of the open-ended question. A payment card gives a range of bids from which the respondent may choose. The bids are arranged in a rectangle starting with zero so as to not indicate a preference for any one bid. The respondent can observe the WTP bids to help narrow in on one particular bid. The payment card seems to capture some positive aspects and avoid some negative aspects of both the open-ended and close-ended questions. Open-ended questions demand a great deal of effort from the respondent. A payment card assists respondents in selecting a bid. Close-ended questions suggest that the researcher has some previous knowledge or expectations of respondents' WTP for a single dollar value. Defining a range of bids does, however, present some of the problems encountered in close-ended questions although they are not as severe.

2.3.2 The Information Problem

The advantages of using the CVM is its broad applicability. The CVM has been used to value nonmarket resources from visibility to whooping cranes. The technique also is easy to apply relative to other nonmarket methods. There are, however, limitations and biases associated with the CVM. This section will consider one these, the information problem.

The information problem occurs when the quality and/or the quantity of information used to describe the contingent situation influences the outcome of the survey. The role information plays in the CVM is not clearly understood. The literature provides mixed results on the impact of information. Many report that information did not significantly influence their studies (Brookshire *et al.*, 1982; Thayer, 1981). Others have have found information to significantly influence their results (Samples, Dixon and Gowen, 1986; and Bergstrom and Stoll, 1987; Boyle, 1988).

The quality and quantity of information plays an important role in adequately describing the contingent market, but for simplicity the discussion here is confined to the role information plays in the first component of the contingent market, the description of the commodity or commodity change. The appropriate length and complexity of the commodity description is where the information problem is most acute, while the other components of the contingent market are relatively straightforward.

The description of the commodity must meet some basic minimum requirements. The description should contain an accurate representation of what is currently known about the commodity and any likely increments or decrements. The actual increment or decrement may be an extremely complex process and be hard to describe given space limitations. For example consider the current acid rain controversy. Suppose there is a current level of some environmental commodity and acid rain poses a potential decrement in the level of provision of that environmental commodity. Information needs to be provided to the respondent on the current level at which the environmental commodity is being supplied and what the projected decrement is. Because there is some uncertainty surrounding the extent of the damage acid rain may cause to the environment, the description of the decrement needs to represent this uncertainty. In addition to describing the commodity there also needs to be some description or definition of the source of the decrement, in this example, acid rain. Therefore as minimum requirements, the description of the commodity needs to contain some basic information on the current level of provision of the commodity, the threatened decrement or proposed increment in the level of provision of the commodity, and the source or cause of the decrement or increment.

Given the basic requirements above the problem still remains as to what impact increased information has on the outcome of contingent valuation surveys. The information problem is compounded by the use of mail surveys. For a mail contingent valuation survey the level of information needs to be sufficient to capture essential details of the commodity and hypothetical market, but brief enough not to bore or confuse the respondent. Mitchell and Carson (1987b) note in their critique of the CVM that many Americans can not even read on an eighth grade level. The CVM designer must walk a fine line in a mail survey. First a sufficient description of the contingent scenario must be constructed to ensure a uniform understanding across individuals. At the same time, a long, involved description of the commodity and market may cause a large percentage of the sample not to respond.

Information may influence the outcome of contingent valuation studies in several different ways. First, information has been shown to influence the magnitude of individual WTP bids (Samples, Dixon and Gowen, 1986; Bergstrom and Stoll, 1987). Samples, Dixon, and Gowen (1986) stated that researchers could provide so much information about the contingent market that individuals' value would become endogenous to the valuation process. This fact alone may invite suspicion among many economists concerning the CVM's ability to measure the respondents' true WTP. Bergstrom and Stoll (1987) offered a different form of reasoning. These authors argued that according to neoclassical theory it is natural for information to influence WTP bids. If utility maximization is the consumers' objective and one constraint facing the consumer is the quantity and quality of information available, then a description that pushes back that constraint and increases utility is fully consistent with theory. They concluded that to increase the accuracy and reliability of values of environmental goods, a certain minimum amount of descriptive information is needed. Even if one accepts the Bergstrom and Stoll argument, what constitutes an appropriate level of information is still ambiguous.

The reliability (variance) of WTP bids may increase with additional information (Bergstrom and Stoll, 1987, and Boyle 1988). Individuals possess many different levels of knowledge of the commodity being valued. Perception about the commodity is thus likely to fluctuate widely among respondents. Using the argument presented by Bergstrom and Stoll (1987), additional information about the commodity is likely to lead to more uniform perceptions. This increase in uniformity is expected to decrease the variance (increase reliability) of WTP bids. Bergstrom and Stoll subsequently report that the reliability of WTP bids did increase with additional information. In the area of wildlife valuation, another study reported that only the reliability of WTP estimates was increased by additional information (Boyle, 1988). Mean WTP bids were unaffected by the additional information. In that study the value of trout was estimated for Wisconsin residents. The study only estimated the value of a wildlife species with high use value and warned against any conclusions about the role that information may play in a species with high existence or option values.

In mail contingent surveys the amount of information may also have a negative impact on the response rate. As mentioned earlier many Americans can not read on an eighth grade level. This indicates a substantial number of the respondents in a contingent survey may only be able to understand a very simple and short description of the contingent market. Increasing the length and complexity of the description may result in the elimination of many of the respondents, thus reducing response rates. This respondent self elimination may also result in a misrepresentation of the population. For instance, low education groups may not be well represented in the returned sample if the contingent scenario is long and complex.

Finally, if information does have a significant impact on WTP bids and response rates, then information also will impact aggregate benefit estimates. If small variations in the amount of information used in the contingent market results in wide fluctuations in aggregate benefit estimates, then questions should be raised about the validity of contingent valuation method benefit estimates.

2.3.3 Biases Associated with the Contingent Valuation Method.

In addition to information there are other limitation and biases associated with CVM (Rowe, d'Arge and Brookshire, 1980; Brookshire, Ives and Schulze, 1976; Cummings, Brookshire and Schulze, 1986; Edwards and Anderson, 1987 and Mitchell and Carson 1987a). This section will consider some of these biases.

First and probably foremost is hypothetical bias. This bias occurs when the respondent provides inaccurate information about his preferences due to the hypothetical nature of the survey. This bias implies that people do not react to the survey the same way they would to an actual market situation. Hypothetical bias is inherit in the CVM and some evidence suggests that it can significantly affect benefit estimation (Bishop and Heberlein, 1986). Hypothetical bias may be the most serious limitation facing the CVM. The effect of this bias can be minimized however by constructing a realistic and familiar contingent market.

Strategic bias arises when individuals purposefully provide false preferences in order to influence the results. In essence the individual lies about his own preferences in order to personally influence or discredit the study. In order for the respondent to act strategically he must be aware of his true preferences and have knowledge of other individuals' WTP. A great deal of knowledge is needed for anyone to behave strategically (Rowe *et al.*, 1980). Proper survey design can substantially reduce or eliminate this form of bias. Several CVM studies have specifically tested for strategic bias and found it was found not to be a problem (Rowe *et al.*, 1980, Brookshire, *et al.*, 1976).

A bias related to the payment vehicle is starting point bias. This bias arises out of the iterative bidding process when the interviewer's starting point in the bidding process influences the respondents' WTP. Although starting point bias can and has presented problems for some researchers (Boyle, Bishop, and Welsh, 1985) others have found it not to be a significant factor (Thayer, 1981; Brookshire *et al.*, 1982). Starting point bias can be minimized by a thorough pretesting of the contingent survey, and it can be tested for by using multiple starting points. The starting point problem and its effect on the iterative bidding process lead Boyle, Bishop and Welsh (1985, p. 193) to suggest that the "iterative bidding is not worth the trouble and expense".

In addition to bias associated with the method per se, the CVM may be associated with various types of sampling bias (Edwards and Anderson, 1987; Mitchell and Carson, 1987a). There are several of these sampling errors. One sample error arises when a nonrandom sample design is used. Another source of bias arises if the population in which benefit estimates are sought does not correspond to the sample population. This can be a result of incorrectly identifying the population which experiences some change in an environmental amenity or simply drawing a sample that misrepresents the population. Statistical comparisons should be made to examine if the sample's demographic and socio-economic characteristics correspond to the population. More serious biases include nonresponse bias and selection bias. These last two problems also are most likely to be associated with mail surveys.

Nonresponse bias arises if there are systematic demographic or socio-economic differences between respondents and nonrespondents. For example, nonresponse bias exists if the sample underrepresents lower education groups and if the lower education group holds different values for the commodity than higher education groups. Statistical techniques can be used to test and correct for differences between respondents and nonrespondents (Filion, 1976; and Fuller, 1974). Moser and Dunning (1985) recommend that the sample be adjusted for nonresponse bias if the response rate is below 50 percent.

Selection bias may be the most serious problem facing mail contingent surveys. Selection bias occurs when nonrespondents censor themselves. Unlike telephone and personal interview CV studies, people receiving a mail CV study can examine the subject matter then choose not to participate. In essence it is more difficult for the respondent to refuse a personal interview than throw a mail questionnaire in the waste basket. Thus for mail surveys, interest in the good being valued is likely to be directly related to the probability the respondent will return the survey. This implies that those individuals who take the time and effort to fill out and return a survey are likely to possess different values for the good than those individuals who look at the survey and toss it in the waste basket. If selection bias is suspected the only way to remedy the situation is to assign a zero bid to all nonrespondents (Mitchell and Carson, 1987b) in order to arrive at a lower bound estimate, or contact nonrespondents directly through telephone or personal interview to gather a response (Loomis, 1987).

CHAPTER 3. The Survey and Statistical Methods

3.1 The Problem Setting

The Environmental Protection Agency evaluates benefits and costs that accrue when banning a pesticide. Prohibiting the use of some pesticide may result in increased production costs to farmers. However, benefits may accrue to groups or individuals that place value on goods negatively affected by the pesticide, such as some wildlife species. In the benefit-cost analysis for these pesticides, the EPA is considering including benefits for nonmarket goods like wildlife in its benefit-cost framework. In this study, the pesticide carbofuran was used to examine the information problem in the context of a proposed ban on the chemical and its impacts on a nonmarket good, wildlife.

Currently, the insecticide Carbofuran is widely used by agricultural interests for insect control when planting corn, alfalfa, soybeans, peanuts, potatoes, and sorghum. In the planting of corn, for example, carbofuran is used to control corn rootworm, and is usually applied in granular form. Carbofuran is one of wide variety of pesticides known as organophosphates (OP's). Organophosphates are the most widely used group of pesticides in North America and their use has been documented to be responsible for killing various species of fish, birds, and other wildlife

(Grue, Fleming, Busby and Hill, 1983). Carbofuran itself has been the cause of death for a variety of wildlife species, including a number of endangered species (Virginia Department of Game and Inland Fisheries, 1987 ; Balcomb, Bowen, Wright and Law, 1984; Flickinger, Mitchell, White and Kolbe, 1986; Balcomb, 1983).

Carbofuran, like other OP's, inhibits the enzyme cholinesterase, which is necessary to breakdown acetylcholine. Excess acetylcholine accumulates at nerve synapses and eventually disrupts nerve function (Grue *et al.*, 1983). Small mammals and birds that feed in or around fields treated with carbofuran can die by consuming the insecticide either accidentally or intentionally. Granivorous birds often consume carbofuran as grit or seed. The insecticide also can enter the food chain when one animal consumes another animal immobilized or killed by carbofuran. This type of secondary poisoning often occurs when a bird eats an insect or worm that is killed or contaminated by the chemical. In one study of a controlled planting of corn using carbofuran, the death of several American robins was attributed to consumption of earthworms that had ingested carbofuran (Balcomb *et al.*, 1984). Raptors also can be poisoned if they feed on another animal stricken with carbofuran (Virginia Game and Inland Fisheries, 1987; Balcomb 1983).

Sublethal doses can affect physiological and behavioral characteristics that may be important for survival (Grue *et al.*, 1983). On the positive side the recovery time from a sublethal dose of OP's is usually less than a month in birds (Grue *et al.*, 1983). Furthermore OP's persistence in the environment ranges anywhere from a few hours to several weeks (Grue *et al.*, 1983).

Carbofuran's effect on wildlife populations is not clearly understood. Researchers hypothesize that although individual mortalities have occurred, populations of most wildlife species as a whole have not been significantly affected. However, carbofuran has been the cause of death to at least 30 different endangered wildlife species, and the loss of even a few animals from an endangered population can cause a delayed recovery or continued decline. In Virginia, carbofuran poses a serious threat to the bald eagle. The threat is considered severe enough for the U.S Fish and Wildlife Service to recommend that Virginia ban carbofuran east of Interstate 95 (Virginia Department of Game and Inland Fisheries, 1987).

For the east coast bald eagle population, the Chesapeake Bay area represents an important habitat. The nesting population of bald eagles in the Bay area is estimated at roughly 125 pairs in addition to a number of migrating eagles that use the area (Taylor, 1982). Maryland and Virginia are among only 10 states in the conterminous 48 states to maintain a sizable nesting population (Grier *et al.*, 1983). The current Virginia population is estimated to be in the neighborhood of 66 breeding pairs. Although population dynamics are not well understood, eagle populations have declined over the last 50 years. In the 1930's the Chesapeake Bay area was estimated to have contained 600 nesting pairs of eagles (the lower bound estimate), a 79 percent decrease therefore took place in 50 years (Taylor, 1982). The population low was reached in the 1970's, primarily as result of DDT contamination which resulted in egg shell thinning and poor reproduction. The nesting population in the Bay area at this time dropped well below 100 pairs (Taylor, 1982). Since the banning of DDT, populations have begun to rebound.

There are several natural and human factors that may hinder the recovery of eagle populations. The bald eagle requires 4 to 6 years to reach breeding age and the mortality in the first 2 years of life is generally thought to be high. Survival in the first year is thought to be heavily dependent on conditions in the wintering period. Furthermore only one or two young are normally raised per nest site (Grier *et al.*, 1983). One of the human factors that is interfering with the eagle recovery is carbofuran. Bald eagle habitat in Virginia is located around the Chesapeake Bay and lower James River basin, where there is also extensive agricultural production. Because eagle habitat is nearly always near agricultural land in this area the chance for eagle contact with carbofuran is likely. The peak feeding periods for the bald eagle are in the spring and summer when their young are being reared. The intense feeding period also coincides with the spring planting season thus further increasing the likelihood of contact between the eagle and carbofuran.

In the last two years carbofuran has been the confirmed source of death for two bald eagles in Virginia and has been highly suspect in four additional eagle deaths (Virginia Department of Game and Inland Fisheries, 1987). Death stemmed from secondary poisoning after the consumption of another animal contaminated with the pesticide. There is no way of knowing the number of unknown deaths caused by the insecticide, therefore the long term effect on local bald eagle populations is also unknown. Debate therefore continues on whether carbofuran poses a significant threat to the Virginia bald eagle population.

The carbofuran-bald eagle controversy presents the opportunity to examine the information problem associated with the CVM. The pesticide affects the wildlife system in complex ways. The challenge is to describe carbofuran's affect on wildlife in sufficient detail without damaging the effectiveness of a mail survey.

3.2 Survey Design

Because the contingent valuation method relies on a survey instrument to gather benefit information, the survey process should be considered a critical component of the study. There are many important steps in the survey process including sample design, questionnaire design, and survey implementation. Sample size and design as well and the correct survey area need to be carefully selected. The questionnaire needs to be designed, pretested, and redesigned until refined. Because this study utilized a mail survey, implementation and actual timing of the mailings played a large role in the success of the survey process. Each of these steps in the creation of a survey should be given careful thought and consideration.

The survey area was defined as the entire state of Virginia. A larger survey area may have been warranted, since the entire Chesapeake Bay eagle population was one of the interests of this study, but the study was constrained by funding. The random list of 2,000 names for the mail questionnaire was derived from telephone directories and supplemented through auto registration. A private company, Survey Sampling, compiled the list. Although some Virginia residents were not represented on the mailing list, the percentage of households not owning either a phone or automobile is small, thus the sampling frame was assumed to correctly represent the population.

Pretesting was administered according to Dillman (1978), and was conducted with residents of Montgomery, Roanoke, Floyd, and Franklin counties. Forty-five individuals participated in the pretest, with this researcher observing. Rural and nonrural individuals participated. A range of socio-economic characteristics such as, income, age, and education were well represented in the pretest sample. In addition to potential participants, professionals in the field of resource economics, wildlife, and survey design evaluated and commented on the questionnaire. Based on the results of the pretest and comments from other individuals, modifications were made in the survey.

The survey used Dillman's Total Design Method in order to ensure an adequate response rate (Dillman, 1978). The survey was in a booklet form (8.5 by 7 inches), was six pages long, and contained 18 questions (see Appendix B for the complete questionnaire). A prepaid business reply envelope was included in which the respondents could return the survey. The entire survey package was mailed first class. The first mailing including a cover letter, survey, and prepaid return envelope, was sent January 26, 1988. The cover letter emphasized the important role the respondent played in the success of the study, guaranteed confidentiality, and offered the respondent a token gift, a summary of the survey results, for those who participated and requested the summary. Each letter was individually signed in pressed blue ball point ink to convey a personal interest in each respondent's participation. One week later a reminder card was sent to all individuals. The postcard thanked those who had returned their questionnaire and urged the nonrespondents to complete and return their questionnaire. A second mailing took place two weeks after the postcard reminder and was sent to all nonrespondents. The cover letter was slightly more insistent in urging each respondent to return the survey. A replacement questionnaire was enclosed. Finally a third mailing was sent to all remaining nonrespondents four weeks after the second mailing. The cover letter was even more insistent and another replacement questionnaire was enclosed. See Appendix C for examples of the cover letters and follow-up post card.

Every effort was made to reach as many of the individuals in the sample as possible. The post office returned many letters with a note indicating that the potential respondent had moved and that the forwarding time had expired. The post office, however, listed the last address known of the respondent on the returned letter. These letters were readdressed and sent to the new address. Also, roughly twenty percent of all the individuals who failed to return the questionnaire after the three mailings and the postcard follow-up were contacted by telephone. The telephone follow-up made a last plea to return the questionnaire through the mail. Each individual contacted also was given the opportunity to answer the questionnaire over the telephone. See Appendix D for details of the telephone follow-up procedure.

Four different questionnaires were sent to Virginia residents to gather willingness to pay bids, and to examine the impact of information. Each survey was mailed to 500 Virginia residents. The four surveys were defined as:

EL - bald eagle (the commodity) with long, detailed information given,

ES - bald eagle (the commodity) with more limited information given,

SL - wildlife chain affected by carbofuran (the commodity) with long, detailed information given, and

SS - wildlife chain affected by carbofuran (the commodity) with limited information given.

Two different commodities were valued, the wildlife system affected by carbofuran and the bald eagle. The pesticide carbofuran impacts the entire wildlife system around agricultural areas that use it. Because the pesticide is believed to only result in a marginal decrement in the population of most wildlife species, most wildlife populations are not thought to be significantly threatened. The process of how the pesticide interacts with the ecosystem, however, is complex and not completely understood. The bald eagle, on the other hand, may be the most visible wildlife species threatened with carbofuran, however, the impact that the pesticide is having on the bald eagle population is also unclear. The carbofuran controversy presented an interesting opportunity to examine the influence of information on contingent valuation surveys. Valuing the entire wildlife system would theoretically capture all benefits arising from a ban, but as stated above, the pesticide's interaction with the ecosystem is a complex and an incompletely understood phenomenon. Describing carbofuran's affect on the wildlife system in adequate detail may be difficult with a mail survey. On the other hand, most wildlife contingent valuation studies have only estimated the value for one species. In the case of carbofuran most concern is being raised over the Chesapeake Bay bald eagle. The bald eagle may be the species most threatened with a nonmarginal decrement in its population. It may be easier to describe carbofuran's impact on just one wildlife species, than for the entire wildlife system.

In addition to the two commodities, long and short descriptions were designed for each of them. The different lengths and complexity of the descriptions were designed to examine the ability of longer, more complex descriptions of the commodities to be contained in mail surveys. The description of each of the two eagle surveys is below, starting with the short description, (ES):

> Currently the pesticide Furadan is used by farmers producing corn, soybeans, peanuts, alfalfa, potatoes, and sorghum. The pesticide is very effective in protecting farmers' plants and newly planted seeds from insects and worms. Furadan, however, may pose a risk to Virginia's bald eagle population. In the last two years Furadan has been the confirmed source of death of two bald eagles and highly suspect in four other eagle deaths.

and for the long description, (EL):

> Currently the pesticide Furadan is used by farmers producing corn soybeans, peanuts, alfalfa, potatoes, and sorghum. The pesticide is very effective in protecting farmers' plants and newly planted seeds from insects and worms. In the United States around 10 million pounds of Furadan is used each year and many farmers believe Furadan is essential to protecting their crops. Furadan, however, may pose a risk to Virginia's bald eagle population.
>
> Today there are around 66 breeding pairs of bald eagles in Virginia, mostly in the Chesapeake Bay area. These numbers represent an increase from an all time low of 32 pairs in 1972. The eagles' numbers have been increasing slowly due to the banning of the pesticide DDT in the early 1970's. The eagle population in Virginia has been increasing since the 1970's but the pesticide Furadan may threaten the recovery. In the last two years Furadan had been the confirmed source of death of two bald eagles and highly suspect in four other bald eagle deaths. There is no way of measuring the total unknown eagle deaths caused by Furadan. The impact of Furadan on the total Virginia bald eagle population is uncertain.

The description of the entire wildlife system affected by carbofuran followed a similar pattern. The descriptions for these two surveys are below, starting with the short description, (SS):

> Currently the pesticide Furadan is used by farmers planting corn, soybeans, peanuts, alfalfa, potatoes, and sorghum. The pesticide is very effective in protecting farmers plants and newly planted seeds from insects

and worms. Furadan, however, has been a documented cause of death for several different wild animals in Virginia.

and for the long description, (SL):

> Currently the pesticide Furadan is used by farmers producing corn, soybeans, peanuts, alfalfa, potatoes, and sorghum. The chemical is very effective in protecting farmers' plants and newly planted seeds from insects and worms. In the United States around 10 million pounds of Furadan is used each year, and many farmers believe Furadan is essential to protecting their crops. Furadan, however, poses risks to wildlife living near treated agricultural land.
>
> Small birds and mammals that feed near Furadan treated fields can die by directly eating some Furadan or worm killed by the pesticide. Larger birds can also die by eating smaller animals contaminated by Furadan. Furadan has caused the death of various individual songbirds, waterfowl, and gamebirds as well as hawks, eagles, and owls that feed on them. For most of these animals Furadan is unlikely to reduce overall populations significantly.
>
> Furadan, however, has been the source of death to a number of endangered species. State and federal officials are now debating whether Furadan poses unreasonable risks to at least 30 species of federally protected wild animals. The animal most seriously threatened by Furadan is the Virginia bald eagle. Today there are around 66 breeding pairs of bald eagles in Virginia. In the last two years Furadan is known to be the source of death of two bald eagles and highly suspect in four additional bald eagle deaths in Virginia. The impact of Furadan on the total Virginia bald eagle population is uncertain.

Different amounts of information were provided about the current levels of the commodity, the threatened decrement, and the source of the decrement. The description of the commodity and threatened decrement differed for all four surveys. The survey SL described the effect of carbofuran on the entire wildlife system and included a description of the threat to the bald eagle. This description involved the current population status of the wildlife species and what is known about the decrements. The short version of the species survey, SS, only mentioned that some wild animals have been impacted by the pesticide. This survey conveyed the least amount of information of the four surveys. Also there was no mention of the extent of the decrement or what species carbofuran has impacted. The surveys describing bald eagle, EL and ES, differed in the amount of information given about the eagles' population status. The short version only mentioned what was known about the number of eagles lost to carbofuran. The longer version gives more information on population trends and current numbers in the population.

In addition to different amounts of information about the commodity, the long and short versions of each commodity contain different amounts of information about the source of the problem, carbofuran. The first two sentences in all four surveys describe carbofuran and what it used for. The longer surveys expanded further on the farmers' use of Furadan. Each of the longer descriptions contained information that would assist the respondent in decision making when confronted with the rest of the contingent market. In other words, the longer surveys better described the commodities based on the requirements for an adequate commodity description presented in Chapter 2. The shorter surveys represented a minimum amount of information but were thought to perhaps be more amenable to a mail survey.

After these descriptions, the respondent was confronted with the contingent market. Each of the four surveys contained the following description:

> Now suppose that Virginia was considering a ban on the pesticide Furadan because of the threat to Virginia wildlife (bald eagle). The ban would be effective in preventing any more wildlife (bald eagle) deaths from Furadan in Virginia but would be costly. The costs of a ban would include:
> *Enforcing and monitoring the ban
> *Research funding to develop substitutes to Furadan
> *Programs to inform farmers of substitutes to Furadan

The WTP question was as follows:

> Suppose Virginia developed a program to carry out the ban on Furadan with the costs described above. What would be the maximum amount you would be willing to pay per year in addition to your regular state income tax bill to support this program?

A hypothetical increase in the state income tax was chosen for the payment vehicle since a tax is the most obvious and familiar way in which society pays for public goods. Protest bids were, however, expected to be higher for a tax than other payment vehicles. In pretesting, roughly 20 percent of the respondents entered a zero bid due to negative feelings about a proposed increase in state income taxes. A tax was still used since it was reasoned that benefits of a realistic payment vehicle outweighed the costs of minimizing protest bids.

The payment card followed. The values were arrayed in a rectangle. The WTP values began at zero and increased in increments of five and ended at a value of $115. A space was provided to allow the respondent to enter other bids not represented on the payment card. If the respondent entered a zero bid, then the respondent was asked to answer a follow up question. The follow up question was designed to determine the reason they entered a zero bid. Based on pretesting, the reasons a respondent would enter a zero bid were as follows:

1) I do not think Furadan is a threat to Virginia wildlife (bald eagle)
2) I will not pay any more in state income taxes
3) I will not pay anything because the ban will not work.
4) Farmers should not get state help for not using Furadan.

Other questions in the survey gathered information for the econometric model and to generate a socio-economic profile of the survey respondents. These socio-economic questions were used to determine to what extent the sample population represented the Virginia population. United States Census data from 1980 were used for this comparison, which will be discussed in Chapter 4 (U.S. Department of Commerce, 1983). These questions gathered age, sex, household size, education, residence, and household income information.

3.3 Model Specification

Four models were estimated to explain WTP for each of the four scenarios. WTP was hypothesized to be related to a number of variables. Many factors were hypothesized to influence the magnitude of the bids, and the variables were used to distinguish the affect on WTP bids. The complete model was specified as follows:

(4) WTP = f(VF, MAG, LICS, F, NGWF, EDU, INCOME, SEX, AGE, RURAL, PATT, FATT, WATT),

where:

WTP = willingness to pay for a ban on carbofuran to protect Virginia wildlife,

VF = wildlife viewing and feeding activity, a nonconsumptive use,

MAG = number of subscriptions to outdoor, wildlife, or natural history publications, a nonconsumptive use,

LICS = intensity of hunting and fishing activities. The number of hunting and fishing licences an individual possess, a use value,

F = association with farming activity,

NGWF = contributor to the Virginia Nongame Wildlife Program,

EDU =	level of education,
INCOME =	household income in 1987,
SEX =	male or Female,
AGE =	age of the respondent,
RURAL =	location of residence, rural, nonrural variable,
PATT =	attitudes toward issues related to pesticides and pesticide use,
WATT =	attitudes toward issues related to endangered wildlife species, and
FATT =	attitudes toward issues related to farming.

More specific definitions of these variables will be presented in the next chapter.

3.4 Variable and Model Justification

The WTP variable was treated as a continuous variable because respondents were given an opportunity to select a bid other than those represented on the payment card. Furthermore all zero bids were included in the regression regardless of whether or not the bids are considered a "protest bid". A protest bid is defined as a zero WTP bid resulting from the respondents displeasure with the payment vehicle (a tax) or some other component of the contingent scenario. Some literature suggests that statistical measures should be used to cull protest bids. Protest bids were included as zero bids in this study because the respondent was valuing the policy in which the wildlife benefits are provided and not just the wildlife commodity itself (Arrow, 1986 and Mitchell and Carson, 1987a). Public goods can not be divorced from the policy through which they are provided.

The variables EDU, INCOME, SEX, AGE, and RURAL were used when aggregating the sample to the general population. Therefore their relationship with WTP was tested for significance. A significant relationship between WTP and these variables suggests that if the means for these demographic variables are different from the population of Virginia, the sample should be adjusted. Variables not significantly related to WTP do not need to be considered when estimating aggregate benefit estimates. Techniques to adjust a nonrepresentative sample are discussed later in this chapter.

In the wildlife valuation area the theoretical basis for selecting explanatory variables is weak. There has, however, been some conceptual, theoretical, and empirical work done in estimating the total value of wildlife species (Randall and Stoll, 1983; and Bishop and Boyle, 1987). This literature has isolated several different components of wildlife value. First there are use values. Use can arise from either hunting and fishing (consumptive use) or from viewing or photographing (nonconsumptive use). Furthermore indirect uses are also identified as arising from reading or watching a television program about wildlife. In addition to these use values, appreciation for wildlife may be generated by simply knowing some wildlife species exists even though there is no intent of direct use of this species in the future. This component of value is existence value. Although previous studies have attempted to estimate these individual components of value, this was not the objective of this study. Instead, the total value of wildlife arising from a ban was estimated. This study hypothesized that individuals participating in these activities hold some value for wildlife and are willing to pay for a ban on Furadan to protect Virginia wildlife.

The variables VF, MAG, LICS, NGWF, and F, were used to explain individuals' WTP for wildlife. First the respondents were asked whether they participated in feeding, viewing or photographing wildlife, VF. The question was designed to indicate whether the respondents possess some nonconsumptive use for wildlife. This variable, VF, was hypothesized to be positively related to WTP. Second, the respondent was asked to indicate which wildlife, outdoor, and natural history publications they subscribed to, the variable MAGS. Spending income in order to read about wildlife indicates some indirect nonconsumptive use value. The magazines selected were based on those magazines with the highest subscription rates (Standard Periodical Directory, 1987). The variable MAGS was hypothesized to be positively related to WTP. The respondents also were given an opportunity to list other publications not represented in the list. The number of publications were then summed for each individual. The variable used to identify those individuals who possess consumptive use value was the extent of their hunting and fishing activities. Income is spent on the purchase of hunting and fishing licences. Information was gathered on which and how many different hunting and fishing licenses they purchased in the last three years, (LICS). There were four different types of hunting licenses and two different types of fishing licenses listed on the questionnaire. The number of hunting and fishing licenses were summed to reflect relative use intensity. The LICS variable was hypothesized to be positively related to WTP. Finally the respondents were asked whether they had contributed to the Virginia Nongame Wildlife Program in the last three years. Contributions to the program, represented by the variable NGWF, do not imply any type of use, and may act as an indicator of existence value. The variable NGWF was hypothesized to be positively related to WTP. Furthermore the hypothetical ban on carbofuran directly affects many farmers, WTP was hypothesized to be negatively related to association with farming activity, F. This variable included all potential users of Furadan and individuals closely identified with the potential users of Furadan.

Recently researchers have begun to draw upon the psychology literature, and more specifically the attitude-behavior literature in attempts to refine the CVM (Bishop and Heberlein, 1986). In psychological terms WTP can be thought of as an expression of an attitude, and behavior can be classified as an individual's action in a real market situation. Furthermore, discussion in the psychology literature indicates that there is an imperfect correspondence between attitudes held and actual behavior. That is, individuals expressing an attitude in the abstract may not behave accordingly. This literature has important implications for CVM in two respects. First the attitude, WTP, does not necessarily equal behavior. This is equivalent to what economists label as hypothetical bias. Second, the psychology literature offers means to examine the likelihood of the attitude-behavior link (Bishop and Heberlein, 1986).

Variables were introduced into the bid function to indicate whether individuals stated attitude (WTP bid) would correspond to an actual situation. These variables attempted to measure why individuals were expressing their WTP values. This included attitudes about Virginia wildlife, pesticides, and farming. There were three attitude variables FATT, WATT, and PATT. FATT was a variable that indicates favorable attitudes about farming and agriculture in Virginia. This variable was hypothesized to be negatively related to WTP, since a ban may imply additional costs to farmers. WATT represented favorable attitudes about society's role in protecting endangered species. This variable was hypothesized to be positively related to WTP. Finally PATT identifies any negative attitudes about pesticides and pesticides use. Because the policy examined was a ban on carbofuran, this variable was hypothesized to be positively related to WTP.

Variables relating similar behavior to the contingent market and WTP bid can be used to examine the relationship between attitude and related behavior. The NGWF variable, for example, is similar to the hypothetical market set up for the ban. Suppose an individual supports the Virginia nongame wildlife fund through the state income tax form and enters a WTP bid. Previous behavior suggests that this individual would carry through on the bid. The NGWF variable would serve as an indication of a strong link between actual behavior (contribution to the nongame wildlife fund) and an attitude (WTP bid). If the bid function indicates some relationship among WTP and variables like ATT and NGWF, it would support the notion that individuals would be likely to carry through on their WTP bid. On the other hand Bishop and Heberlein (1986, pp. 145-46) stated, "If no relationship exists, doubts would arise about the prospects for a strong attitude-behavior relationship. The validity and, hence, the policy relevance of the economic values would be more questionable".

The attitude and socio-economic variables were checked between the four different descriptions of the commodity. The four surveys each described a ban on carbofuran to protect wildlife. The different surveys, in general, described the same policy. Variables were then cross compared across the four models to examine which were sensitive to different types of information. Variables that yield consistent performance across models may be considered reliable and consistent explanatory variables and could be used for future model specifications in similar contingent valuation studies. If these variables do not perform consistently then this could raise questions concerning the reliability of the variables, predictive and explanatory power of the models, or the impact of information on the WTP function. Inclusion of key socio-economic and preference variables may also indicate how benefits may change over time with changing demographics.

3.4.1 Statistical Analyses

A linear ordinary least squares regression model was used to estimate the WTP function. The model was tested for cross-sectional data problems, namely multicollinearity and heteroskedasticity. Variance inflation factors and cross correlation matrixes were used to test for collinearity problems. The Breusch and Pegan and Ramsey test was used to detect any heteroskedasticity problems (Maddala, 1988).

3.5 Hypotheses Tested

First, tests were designed to determine the effect that different levels of information have on response rates. Different levels of information may provide different incentives to individuals to return the questionnaire. Thus it was hypothesized that the amount of information would result in different response rates between the long and short surveys for each commodity. The response rate for the surveys containing detailed, lengthy descriptions of the commodities was hypothesized to be less than that for the surveys containing shorter descriptions of the commodities as follows:

$RR_{EL} = RR_{ES},$

$RR_{EL} < RR_{ES},$

and:

$RR_{SL} = RR_{SS},$

$RR_{SL} < RR_{SS}.$

Because these sample proportions approximate a normal distribution, the following z-statistic was used to test these hypotheses on mean WTP:

$$\frac{\hat{P}_{Long} - \hat{P}_{Short}}{\sqrt{\overline{P}(1-\overline{P})[1/n_{Long} + 1/n_{Short}]}} \simeq Z = N(0, 1),$$

where:

$\hat{P}$ = sample proportions,
$\overline{P} = n_{long}P_{long} + n_{short}P_{short}/n_{long} + n_{short}$,
n_{long} = number of returned surveys for the long descriptions, and
n_{short} = number of returned surveys for the short descriptions.

The variances of the WTP bid for long surveys were hypothesized to be less than the shorter surveys. It was thought that the more detailed information at the disposal of the individual the better an individual would be able to focus in on what exactly he or she is valuing. These hypotheses can be stated formally as:

H_0: $\sigma^2_{EL} = \sigma^2_{ES}$,

H_1: $\sigma^2_{EL} < \sigma^2_{ES}$,

and:

H_0: $\sigma^2_{SL} = \sigma^2_{SS}$,

H_1: $\sigma^2_{SL} < \sigma^2_{SS}$.

To test for differences between variances a ratio of the variances was taken. Since the ratio of variances from two independent samples follow a F-distribution, a simple F-test was used to test differences between variances. The F-statistic was calculated as:

$$\sigma^2_{Long}/\sigma^2_{Short} = F_{n_{Long-1},\, n_{Short-1}}.$$

The mean WTP bids were also hypothesized to be different for different levels of information for each commodity. The following hypotheses were designed to determine whether the level of information affects the magnitude of WTP bids. There were no *a priori* hypotheses made regarding the direction of the potential changes. The level of information was hypothesized to affect the WTP bids as follows:

H_0: $WTP_{EL} = WTP_{ES}$,

H_1: $WTP_{EL} \neq WTP_{ES}$,

and:

H_o: $WTP_{SL} = WTP_{SS}$,

H_1: $WTP_{SL} \neq WTP_{SS}$.

The differences between the commodities, the bald eagle and the wildlife system were also tested. Because the bald eagle is only one of many wildlife species that stands to benefit from a ban, the WTP for the bald eagle was hypothesized to be less than for the entire wildlife system. This hypothesis was tested for the long versions of each commodity, EL and SL, and for the short version of each commodity, SS and ES. These hypothesis can be stated as follows:

H_0: $WTP_{EL} = WTP_{SL}$,

H_1: $WTP_{EL} < WTP_{SL}$,

and:

H_0: $WTP_{ES} = WTP_{SS}$,

H_1: $WTP_{ES} < WTP_{SS}$.

Because these hypotheses involve tests between two sample means, the following t-statistic was used to for these tests:

$$t = \frac{\overline{WTP}_{Long} - \overline{WTP}_{Short}}{\sqrt{\sigma^2(1/n_{Long} + 1/n_{Short})}},$$

where:

σ^2 = a pooled sample variance between the two means.

3.6 Estimation of Aggregate Benefits

The purpose of any contingent valuation analysis is to generate benefit estimates for natural resource and environmental amenities for the population of interest. Aggregate benefits in this study were generated for each of the four scenarios, and compared to examine the effect of information on benefit estimation. Wildlife benefits stemming from a ban on carbofuran were estimated for Virginia citizens over eighteen years in age.

Aggregation based on mail surveys is a difficult task. The main problem involves the treatment of nonrespondents. Ideally a complete response would be obtained for the entire sample to eliminate nonresponse and selection biases. Collecting a complete response, however, would require a tremendous amount of time and effort, at a high cost. One option is to contact a sample of the nonrespondents through a telephone follow-up and obtain critical WTP and socio-economic information (Deming, 1960). A second option would be to make some assumptions about the nonrespondents. In order to avoid these assumptions, a telephone follow-up was attempted. The follow-up, however, failed to yield a sufficient sample to make any inferences about the nonrespondents, thus assumptions about the nonrespondents had to be made. The telephone follow-up is discussed further in the next chapter.

Three different aggregation techniques were utilized, with each possessing a different set of assumptions. These three techniques were used to generate benefit estimates for each of the four different surveys. The impact of information on aggregate benefits was then compared for each of the three aggregation techniques.

The first two aggregation techniques were used to create a upper and lower bound on aggregate benefits. The upper bound assumed that no selection or nonresponse bias was present. Under these assumptions aggregation was straight forward. The number of individuals in the relevant population was simply multiplied by the mean WTP to generate benefit estimates. A lower bound estimate was also generated assuming the presence of severe selection bias. In this case nonrespondents were assumed to possess different WTP than respondents with similar socio-economic profiles. Each individual in the sample who did not return a survey received an initial survey, a reminder postcard, and two follow-up letters with replacement surveys. These nonrespondents received letters and reminders to return the survey for two months. After allowing such an extended opportunity to respond, it may be valid to assume that those who did not respond have different (lower) values for the ban than those who did. In this case an estimate of aggregate benefits was generated by assigning all nonrespondents a zero bid. It must be emphasized that such a procedure will yield a conservative estimate of total benefits since it is unlikely that every nonrespondent will place a zero value on wildlife and the ban.

A third aggregation technique that assumed no selection bias but corrected for any nonresponse bias present was employed. Socio-economic variables in the econometric model that were found to be unrepresentative of the population were employed in a weighting procedure involving the OLS equation (Schulze *et al.*, 1983). The WTP function (equation 4) employed state averages for unrepresentative socio-economic variables rather than sample means. The econometric model then predicted WTP based on these state averages. The predicted WTP was multiplied by the number of individuals over 18 years of age in the population to derive the benefit estimate.

CHAPTER 4. Empirical Results

4.1 Survey Results

The entire survey process began January 26 with the first mailing and ended with a cutoff date of April 25. The postcard follow-up, second mailing, and third mailing were sent February 2, February 16, and March 15 respectively. The telephone follow-up interviews took place April 4 through 6. Of the 2,000 questionnaires mailed, 322 were not delivered. Reasons for letters being undeliverable were: insufficient address, respondent deceased, moved and left no forwarding address, moved out of state, or simply addressee unknown. The 322 marked undeliverable were dropped from the sample, leaving an effective sample of 1,678.

Response rate was defined as all returned questionnaires divided by the effective sample size, 1,678. All individuals who made efforts to complete the questionnaire were counted as respondents. A total of 1011 questionnaires were returned during the course of the three mailings and telephone follow-up, which was a 60 percent response rate.

The initial mailing, postcard and second mailing accounted for 86.4 percent of the returned questionnaires. The third mailing contributed 12 percent to the returned sample. Of the nonrespondents remaining after the third mailing over 20 percent were chosen at random to participate in the telephone follow-up, a total of 141 individuals. Of these 141 nonrepondents, 52 could not be located because of unlisted phone numbers or because there was no answer. Twenty nine individuals were contacted but refused to participate in the study. The remaining 60 stated that they would participate by returning the questionnaire, but only 16 actually returned questionnaires or completed the survey as a telephone interview. The telephone follow-up failed to yield an adequate sample size to make any inferences about the nonrespondents. Additional calls could not be made due to time and funding constraints. Asking people to respond by returning the mail survey was unsuccessful and the telephone follow-up should have attempted to obtain telephone interviews from all individuals that were contacted. The telephone interviews were not initially attempted because mail and telephone surveys each possess different strengths and weaknesses. Thus, the use of telephone interviews in a mail designed survey may have introduced vehicle bias. A summary of mean and frequences, as appropriate, of all variables in the survey are contained in Appendix E.

4.2 Hypothesis Tests on Information

4.2.1 Impact on Response Rates

The overall response rates for each of the four surveys are presented in Table 4.1. The following hypotheses were made about the effect of the level of information provided in the contingent marketus on response rates:

(5) H_0: $RR_{EL} = RR_{ES}$ verses H_1: $RR_{EL} < RR_{ES}$, and

(6) H_0: $RR_{SL} = RR_{SS}$ verses H_1: $RR_{SL} < RR_{SS}$.

Table 4.1. Response Rate for the Four Surveys

Sample	EL	ES	SL	SS
TOTAL MAILED	500	500	500	500
UNDELIVERABLE	78	81	80	83
NUMBER RETURNED (n)	257	254	229	271
RESPONSE RATE (%)	60.9	60.6	54.5	65.0

EL = Long description of the bald eagle

ES = Short description of the bald eagle

SL = Long description of wildlife species

SS = Short description of wildlife species

A test of proportions that approximates a normal distribution was used to test these hypotheses. The test between the EL and ES surveys yielded a z-statistic of .089; thus the null hypothesis, that the response rate were equal for EL and ES, could not be rejected even at a 0.5 level of significance. However the null hypothesis that the response rate between the SL and SS were equal could be rejected at the 0.01 level of significance. This test yielded a z-statistic of 3.07.

The difference in response rates between SS and SL was expected given the limitations of mail questionnaires. However, the closeness of between ES and EL was unusual. One explanation lies in the fact that the SS and SL both were extreme cases. The SS survey was the shorter and simpler of the four surveys while SL was longer and more complicated than the others. ES and EL contained different amounts of information but not to the extremes of SS and SL. To some extent then, the length and complexity of information given in the contingent market seems to have affected response rates.

All zero WTP bids were included in the estimation of means and in later analysis. Other zero bids were included in all subsequent analyses because public goods cannot be valued independent from means (the tax) with which they are provided. Therefore a zero bid entered because of a disagreement about a component of the policy is a legitimate zero bid. As illustrated in Table 4.2, most zero bids arose out of protest against the payment vehicle. The only surveys dropped from the analysis were those individuals who did not answer the WTP question or those who were too confused by the contingent scenario. In Table 4.2 this category is represented by "Confused/No Answer".

4.2.2 Impact on WTP Variances

Mean WTP and their variances for each of the four surveys are presented in Table 4.3. The following hypothesis were tested for the impact of information on the WTP variances:

(7) H_0: $\sigma^2_{EL} = \sigma^2_{ES}$ verses H_1: $\sigma^2_{EL} < \sigma^2_{ES}$, and

Table 4.2. Reasons for Entering a Zero Bid and Percentage of Zero Bids with each Type of Survey

Reason	EL (%)	ES (%)	SL (%)	SS (%)
Furadan is not a threat to wildlife	9.6	10.3	16.4	8.1
Will not pay any in taxes	56.1	49.1	35.5	56.6
A ban will not work	5.3	10.3	6.4	6.6
Farmers should not receive state help	15.8	17.2	23.6	14.7
Other reasons	7.0	4.5	7.2	6.6
Confused/No answer	6.1	8.6	10.9	7.4

Percent of zero bids in sample	42.8	43.2	44.2	48.3

EL = Long description of the bald eagle

ES = Short description of the bald eagle

SL = Long description of wildlife species

SS = Short description of wildlife species

Table 4.3. Mean Willingness to Pay for the Four Scenarios

Survey	Sample Size (n)	Mean ($)	Standard Deviation ($)
EL	250	13.30	23.03
ES	243	14.36	24.51
SL	217	16.13	27.07
SS	261	13.56	24.33

EL = Long description of the bald eagle

ES = Short description of the bald eagle

SL = Long description of wildlife species

SS = Short description of wildlife species

(8) H_0: $\sigma^2_{SL} = \sigma^2_{SS}$ verses H_1: $\sigma^2_{SL} < \sigma^2_{SS}$

F-tests were used to test each of these hypotheses. The null hypothesis that the variances for the long detailed survey are equal to the shorter survey for the EL and ES yielded a F- statistic of 1.13. The null hypothesis in (7) could therefore not be rejected. The F-statistic for the tests between SL and SS proved contrary to initial speculation. Initially it was reasoned that with increasing information, the variance would decrease. The hypothesis as originally stated in (8) could not be rejected since $\sigma^2_{SL} > \sigma^2_{SS}$. In fact a test on $\sigma^2_{SL} > \sigma^2_{SS}$ proved significant at the 0.05 level of significance. This test yielded a F-statistic of 1.24.

A probable explanation for the unexpected result of the SL scenario having a larger variance in mean WTP than SS is as follows. Originally the author hypothesized that additional information about the commodity would likely lead to more uniform perceptions about the commodity. The increase in information, however, may increase the respondent's understanding of commodity being valued which could lead respondents to more accurate although more dispersed WTP bids. In this particular study more information on the pesticide and its effect on wildlife may have caused some respondents to view the pesticide as more of a threat to wildlife and other individuals to see the pesticide as less of a threat leading to an increase in the variance of mean WTP.

4.2.3 Impact on WTP Bids

Tests also were made concerning the impact of information on mean WTP. The following two hypothesis were made concerning the impact of the amount of information on mean WTP.

(9) H_0: $WTP_{EL} = WTP_{ES}$ verses H_1: $WTP_{EL} \neq WTP_{ES}$, and

(10) H_0: $WTP_{SL} = WTP_{SS}$ verses H_1: $WTP_{SL} \neq WTP_{SS}$.

Using a t-test, neither of the null hypotheses could be rejected at the 0.05 level of significance. The test on (9) yielded a t-statistic of -0.496 and (10) yielded a t-statistic of 1.08. The amount of information therefore did not significantly influence WTP bids, within the commodity descriptions.

The impact of the description of the commodity on WTP was also statistically examined. The two commodities described were the wildlife species most threatened by carbofuran, the bald eagle, and the entire wildlife system that is affected by the pesticide. The following hypothesis on WTP were tested:

(11) H_0: $WTP_{EL} = WTP_{SL}$ verses H_1: $WTP_{EL} < WTP_{SL}$, and

(12) H_0: $WTP_{ES} = WTP_{SS}$ verses H_1: $WTP_{EL} < WTP_{SL}$.

Neither null hypothesis in (11) or (12) could be rejected at the 0.05 level of significance. The t-statistics for (11) and (12) were -1.21 and 0.366 respectfully. Thus, the two different descriptions of the wildlife commodity did not significantly influence WTP. In summary there were no statistical differences between any of the four WTP estimates.

It must be noted that these mean WTP results were derived from Virginia residents only. Virginia residents in particular have had previous experience with pesticide bans, most noticeably DDT in the 1970's. The widely publicized role DDT played in the contamination of the Chesapeake Bay was a key focal point in the banning of DDT. Therefore WTP values revealed here may not be applicable to other areas of the country without this experience.

4.3 Econometric Model

The regression model shown below was estimated using ordinary least squares. The final model estimated was:

$$(13)\quad WTP = \beta_0 + \beta_1 VF + \beta_2 MAGS + \beta_3 LISC - \beta_4 F + \beta_5 NGWF + \beta_6 SEX + \beta_7 AGE + \beta_8 INCOME + \beta_9 HIGH + \beta_{10} SCOLL + \beta_{11} COLL + \beta_{12} SGRAD + \beta_{13} GRAD + \beta_{14} RURAL - \beta_{15} FATT + \beta_{16} PATT + \beta_{17} WATT .$$

Several different definitions of the variables in the econometric model were tested to see which provided the best fit. The specific definitions that worked best in the econometric model were as follows:

VF = Intensity of viewing and feeding activity. The variable took on the values 0, 1 or 2, with no participation in either wildlife viewing or feeding represented as 0. Participation in both feeding and viewing represented as 2, and participation in only one of these activities as 1.

MAG = The number of subscriptions to outdoor, wildlife, or natural history publications.

LICS = The number of hunting and fishing licences an individual possessed. A total of four different hunting and two different fishing licenses were possible.

F = An index of the association with farming activities. This variable was created out of the answers to four survey questions. The first two questions indicated whether the respondent was a farmer who produced crops which carbofuran is generally used on and whether the respondent was another type of farmer who may not directly use carbofuran, questions 6 and 8 in the questionnaire. The second two questions were related to whether the respondents had close friends or relatives who were either farmers who were likely to use carbofuran (question 7) or were farmers who were not likely to use carbofuran (question 9). For each of the questions, their answers took on the value of 0 = No association with farming activity and 1 = association with farming activity. Thus the range of F was from 0 to 4, with 0 representing no association with farming.

NGWF = Contributor to the Virginia Nongame Wildlife Program. A dummy variable where 0 = noncontributor and 1 = contributor.

HIGH = An education dummy variable indicating that high school was the highest level of education completed, where 0 = No and 1 = Yes.

SCOLL = An education dummy variable indicating that some college education was the highest level of education completed, where 0 = No and 1 = Yes.

COLL = An education dummy variable indicating that college was the highest level of education completed, where 0 = No and 1 = Yes.

SGRAD = An education dummy variable indicating that some graduate education was the highest level of education completed, where 0 = No and 1 = Yes.

GRAD = An education dummy variable indicating that a graduate degree was the highest level of education completed, where 0 = No and 1 = Yes.

INCOME = Total household income in 1987 in thousands of dollars.

SEX = Male or female, male = 1, female = 2.

AGE = Age of the respondent in years.

RURAL = Location of residence. Rural, nonrural dummy variable where rural = 0 and nonrural = 1.

FATT = Farming attitudes. This variable was derived from the summation of the attitude questions 1A and 1B in the questionnaire. Questions 1A and 1B each took the range of 1 - 4, with 1 representing the most positive attitude toward farming, and 4 representing the most negative attitude. Possible values for this variable were therefore 2 to 8.

PATT = Pesticide attitudes. This variable was derived from the summation of the attitude questions 1C, 1D, and 1E in the questionnaire. Questions 1C, 1D, and 1E each took the range of 1 - 4, with 1 representing the most positive attitude toward pesticides, and 4 representing the most negative attitude toward pesticides. Possible values for this variable were therefore 3 to 12.

WATT = Endangered species attitudes. This variable was derived from attitude question 1F in the questionnaire. The variable takes the range of 1 - 4, where 4 is the most positive attitude toward endangered species preservation, and 1 is the most negative attitude toward endangered species preservation.

$\beta_0 .....\beta_{17}$ = The coefficients to be estimated.

The results of the four regressions for each contingent scenario are presented in Tables 4.4. through 4.7. The EL survey provided the best overall fit, with a $\overline{R}^2$ of 0.2754. The survey that provided the least amount of information to the respondent about the commodity, SS, produced the lowest $\overline{R}^2$. The models were tested for two different problems frequently encountered with cross-sectional data, collinearity and heteroscdasitcity. All four models were judged to be free of any collinearity problems. A cross correlation matrix was formed with all independent variables. All correlation coefficients were quite small, with the largest being only 0.53. Variance inflation factors (VIF) also were estimated for each independent variable. The largest VIF was 3.5. Generally VIF's greater than 5 suggest potential collinearity problems. Each of the four models, however, possessed heteroskedasticity problems based on the Ramsey test and the Breaush and Pagen test. Heteroskedasticity provides unbiased and consistent estimators but they do not have

Table 4.4. Regression Results for Eagle/Long (EL) Model

Variable	Estimated Coefficient	t-Statistic
INTERCEPT	-38.447**	-2.214
VF	3.044	1.474
MAGS	2.954**	2.088
LISC	-2.136	-1.553
F	-1.445	-0.966
NGWF	8.119**	2.080
SEX	1.829	0.528
AGE	-0.149	-1.436
INCOME	0.122	1.573
HIGH	1.163	0.220
SCOLL	0.777	0.144
COLL	3.352	0.547
SGRAD	4.392	0.615
GRAD	18.164**	2.495
RURAL	-7.628**	-2.431
PATT	1.667*	1.772
FATT	0.709	0.425
WATT	8.707**	2.900

F-Statistic = 5.963**

$\bar{R}^2$ = 0.2754

n = 222

* = statistically significant at the .10 level

** = statistically significant at the .05 level

Table 4.5. Regression Results for Eagle/Short (ES) Model

Variable	Estimated Coefficient	t-Statistic
INTERCEPT	-22.545	-1.262
VF	1.940	0.812
MAGS	0.459	0.331
LISC	-2.849*	-1.839
F	2.989*	1.839
NGWF	10.395**	2.424
SEX	-4.497	-1.210
AGE	-0.112	-0.991
INCOME	0.175**	2.036
HIGH	-4.134	-0.674
SCOLL	-0.472	-0.075
COLL	7.540	1.008
SGRAD	15.136*	1.945
GRAD	-0.211	-0.028
RURAL	-0.152	-0.044
PATT	1.138	1.235
FATT	-1.578	-0.937
WATT	10.946**	3.214

F-Statistic = 4.077**

$\overline{R}^2$ = 0.1921

n = 220

* = statistically significant at the .10 level

** = statistically significant at the .05 level

Table 4.6. Regression Results for Species/Long (SL) Model

Variable	Estimated Coefficient	t-Statistic
INTERCEPT	-27.737	-1.186
VF	7.694**	2.681
MAGS	3.489**	1.971
LISC	-0.944	-0.560
F	-2.557	1.213
NGWF	-1.440	-0.259
SEX	9.320*	1.960
AGE	0.100	0.718
INCOME	0.279**	2.674
HIGH	14.343**	1.983
SCOLL	4.214	0.601
COLL	5.965	0.775
SGRAD	4.312	0.444
GRAD	15.870*	1.926
RURAL	0.531	0.114
PATT	1.117	0.997
FATT	-3.048	-1.534
WATT	3.294	0.769

F-Statistic = 3.382**

$\overline{R}^2$ = 0.1780

n = 187

* = statistically significant at the .10 level

** = statistically significant at the .05 level

Table 4.7. Regression Results for Species/Short (SS) Model

Variable	Estimated Coefficient	t-Statistic
INTERCEPT	-54.129**	-2.745
VF	-0.601	-0.250
MAGS	0.033	0.023
LISC	0.140	0.085
F	-0.450	-0.258
NGWF	14.504**	2.923
SEX	-1.300	-0.322
AGE	-0.001	-0.009
INCOME	0.282**	3.391
HIGH	0.300	0.044
SCOLL	-1.246	-0.193
COLL	-4.570	-0.655
SGRAD	0.227	0.026
GRAD	-4.585	-0.621
RURAL	-4.595	-1.284
PATT	1.268	1.198
FATT	3.618*	1.902
WATT	8.653**	2.538

F-Statistic = 2.791**

$\overline{R}^2$ = 0.1187

n = 226

* = statistically significant at the .10 level

** = statistically significant at the .05 level

minimum variance. The heteroskedasticity problem was not corrected since the estimates were unbiased and having parameter estimates that were not minimum variance did not hinder the achievement of the objectives of the study.

4.3.1 Variable Performance

For each of the four models, all significant coefficients of the variables possessed the hypothesized signs except the LISC (hunting and fishing licences) and F (association with farming activity) variables in the eagle/short (ES) model, and the FATT (farming attitudes) variable in the species/short (SS) model. For clarity it should be pointed out that these coefficients were not significantly different from zero in the other models. The positive coefficient on the F variable in the ES model indicated that as association with farming activity increased an individual will increase their WTP for a ban on carbofuran. One explanation not originally hypothesized for this finding is that people closely associated with farming may possess more information and be more aware of the potential problems surrounding pesticide use. Another explanation is simply that the data collected in the survey was not specific enough. Perhaps a better construction of this variable would have been to identify actual users of carbofuran. The negative sign associated with the coefficient of the farming attitude variable, FATT, in the SS model also contradicts the original hypothesis. Why WTP increases with positive attitudes about farming is unclear. Perhaps the positive support given to farmers in the hypothetical market (i.e. developing safe substitutes for Furadan) would help in explaining the positive sign associated with both the coefficients of FATT in the SS model and F in the ES model. The negative sign associated with the coefficient of the LISC variable was also unexpected in the ES scenario. In this scenario the significance of the coefficient on the LISC variable should be interpreted with respect to a wildlife species with absolutely no direct consumptive use value, the bald eagle. The EL model which only described the bald eagle also produced a negative (although not significantly different from zero) sign for LISC. This seems to suggest that individuals with high consumptive uses for wildlife (measured by LISC) value game wildlife differently (more) than nongame wildlife. Another explanation is that high consumptive users may view the bald eagles as competitors for game species. This explanation is reinforced by examining LICS in the SS model. The SS scenario makes no mention of which species is being affected and is also the only model where the coefficient of LISC is positive although not significantly different from zero. The respondents may have thought that the pesticide would have some affect on game species. With some uncertainty as to which wildlife is affected, high consumptive users of wildlife may place more value on a carbofuran ban.

Some variables performed well regardless of the type of information provided to respondents. INCOME was significant in three models (the ES, SL, and SS models) and generated consistent (positive) coefficient estimates. Generally, the models predicted that for every $1,000 increase in income there will be a 17 to 28 cent increase in WTP. Other variables that preformed well across models were the NGWF (contributors to Nongame Wildlife Fund) and WATT (positive attitudes about species preservation) variables. Each of these two variables were significant in every model except in the SL model. Again, each of these variables possessed similar coefficients across models. The models indicated that if respondents had contributed to the Virginia Nongame Wildlife Fund, they would be willing to pay $8 to $14 more for a ban than those who did not contribute. The coefficients on the WATT variable indicated that if respondents had strong positive attitudes toward endangered species preservation, they would be willing to pay more for a ban than those who held negative attitudes about endangered species preservation. The strong showing by these wildlife related variables indicates that attitudes about wildlife are a major factor in determining WTP for a ban on carbofuran, despite the finding that the description of the types of wildlife affected had little impact on WTP.

The education dummy variables also played an important role in every model except the SS model. The dummy variable GRAD, respondents with a graduate degree, was positive and significantly different from zero in the EL and SL models. In these models GRAD was positive indicating that individuals with a graduate degree are WTP $18 and $14 more, respectively, than a person with less than a high school degree for a ban on carbofuran. In the ES model the coefficient of SGRAD was also positive, indicating that an individual with some graduate level education is willing to pay $15 more than a person with less than a high school degree. In the SL model the coefficient on the education dummy, HIGH was also significant and positive, indicating that a high school graduate would be willing to pay $14 more than a person with less than a high school degree.

4.3.2 The Role of Information in Model Estimation

The four models each generated substantially different results. Except for variables mentioned in the previous section, most variables did not perform consistently across models. For instance the coefficients of variables like, PATT, RURAL, FATT, and SEX were significantly different from zero and possessed the hypothesized sign in only one model while giving poor performances in the other three models. Also the $\overline{R}^2$ was substantially different among the models. This suggests that the models are sensitive to the amount and type of information provided about the commodity.

Further insights on the impact of information on model estimation can be gained by comparing specific models. The SL model, which contained the longest commodity description, differed the most from the other models. First, the model possessed very few significant coefficients on variables in common with the other models. Attitude variables, whose coefficients were significant in the other models, were not significant in the SL model. Also the coefficient of the NGWF variable was insignificant even at the 0.1 level in the SL model, while it was significant at the 0.05 level in the other three models. All attitude type variables in the SL model were not significantly different from zero. Given the Bishop and Heberlein argument for including attitude variables, presented in Chapter 3, these results may indicate an increased presence of hypothetical bias in the SL model. Large amounts of information may motivate the respondent to provide an answer that meets what he perceives as the researchers expectations rather than one that reflects his personal preferences. Although the SL model provided the most information, the EL model also contained a long description. The SL scenario only provided additional information above the eagle/long (EL) scenario on other wildlife species that are impacted by carbofuran. This research could not ascertain why the SL and EL models produced such different results. However, one interesting similarity exists between these two models: the coefficient of the variable MAGS was similar in magnitude. The MAGS variable was as one of the few variables which behaved similarly in the two models and was also not significantly different from zero in the ES and SS models. A positive response to the survey question associated with this variable implies that the respondent must at least possess some basic reading skills. It is therefore perhaps not unusual then for the coefficient of this variable to be significantly different from zero only for the two longest contingent descriptions: SL and EL, which required the most reading.

Comparing the two extreme cases of the amount information, SL and SS, indicates that the level of information provided about the commodity can have a substantial impact on the WTP function. Only one variable, INCOME, gave a consistent performance in each of the two models. The inconsistency that information creates between the four models may have consequences in aggregation, since many aggregation techniques involve the use of the WTP function (Loomis, 1987).

4.4 The Impact of Information on Aggregate Benefit Estimates.

The purpose of contingent valuation is to generate aggregate benefit estimates for nonmarket goods. The impact of information on aggregate benefits derived from the contingent valuation method, therefore, was examined. Using the three methods described in Chapter 3, aggregate benefit estimates for a ban on carbofuran were generated. The relevant population was all Virginia adults (18 years of age and older), as obtained from the 1980 Census, of 3.66 million (U.S. Department of Commerce).

Benefit estimates were generated under different assumptions. First benefits were estimated assuming no nonresponse and selection biases. When working under this assumption no adjustments in aggregation needed to be made. Each mean WTP for the four different surveys were simply multiplied by the population, 3.66 million. Second, a lower bound estimate was generated under the assumption that severe selection bias is present. Zero bids were assigned to all nonrespondents and means were recalculated including these zero bids. The adjusted mean WTP bids were then multiplied by the population estimate. The assigning of zero bids to all nonrespondents is assumes the worst case scenario, that anyone not returning the questionnaire did so because they did not value a ban on carbofuran to protect eagles and/or other wildlife.

A weighting procedure was also used because nonresponse bias was found to be present, that is, demographic variables whose coefficients were significantly different from zero also were found to be unrepresentative of the population. Based on a simple t-test of means, the hypothesis that income was equal between the sample and the population (Census) was rejected at the 0.01 level of significance for all four questionnaires. Mean sample incomes ranged from $37,500 to over $40,000 while the adjusted mean population income was estimated to be $32,015 in 1987. Also the education dummies GRAD and SGRAD did not accurately represent the population. Based on proportion tests similar to those used in the hypothesis tests on response rates, low education groups were under represented in the sample, and GRAD and SGRAD were over represented in the sample based on a .05 level of significance. The education dummy, HIGH, was found to be representative. Females were also under represented in the sample.

A weighting procedure was used to correct for nonresponse bias using the OLS regression results (Schultz *et al.*, 1983). A regression was estimated for each of the four models with all variables which had a significant impact on WTP (significant at the .1 level) in the initial model estimation with the results presented in Table 4.8. Each of these four regression models, no collinearity was identified but some heteroskedasticity was found to be present.

All demographic variables, except the variable HIGH, in these four equations were not representative of the population. State averages from the 1980 Census were substituted into the equations for the demographic variables. The state average for income was $32,014. The average

Table 4.8. Regression Results for the Weighting Procedure

Variable	EL	Parameter ES	Estimates* SL	SS
INTERCEPT	-40.775 (-4.058)	-39.206 (-3.811)	-25.944 (-3.388)	-45.811 (-3.443)
VF	___	___	7.538 (2.854)	___
MAGS	2.013 (1.729)	___	3.204 (2.042)	___
LISC	___	-2.274 (-1.860)	___	___
F	___	-2.691 (-1.878)	___	___
NGWF	9.062 (2.519)	11.84 (2.859)	___	11.861 (2.669)
SEX	___	___	11.142 (2.645)	___
INCOME	___	0.242 (3.525)	0.326 (3.490)	0.253 (3.862)
RURAL	-4.530 (-1.684)	___	___	___
HIGH	___	___	9.296 (2.022)	___
SGRAD	___	14.951 (2.911)	___	___
GRAD	18.159 (4.126)	___	11.537 (2.063)	___
PATT	1.981 (2.353)	___	___	___
FATT	___	___	___	2.832 (1.751)
WATT	10.503 (3.895)	12.318 (4.068)	___	9.188 (2.952)
F-statistic	13.049	9.768	8.223	10.370
R^2	0.2322	0.1916	0.1826	0.1386
n	239	222	194	233

* t-statistics are in parenthesis under the parameter estimates.

state percentages for the variables SEX, GRAD, and SGRAD were 51 percent female, 5.8 percent with a graduate degree, and 3.2 percent with some graduate work, respectively. Sample means were used for variables, such as the attitude variables, when no population estimates were available. A WTP estimate was then generated by substituting state averages in for the variables in these equations. For example the education dummy variable SGRAD was found to be unrepresentative in the ES model. The sample average was 0.09 and the population average was 0.032. The value 0.032 was substituted into the regression model for the variable SGRAD. The model then generated a new WTP estimate based on the population averages. The estimated WTP was then multiplied by the total population to derive a aggregate benefit estimate.

The aggregate benefits estimated for the four scenarios using each of these three techniques is presented in Table 4.9. The lower bound estimates for a ban were very similar across the four different scenarios. The estimates using no adjustments and the weighting technique generated a wider range of benefits than the lower bound approach.

The individual sample WTP estimates as stated earlier in the chapter did not differ significantly from each other in any of the four scenarios, but aggregating over a large population generated a large range of benefit estimates. For instance the largest mean WTP ($16.13 for SL) was only 17 percent larger than the smallest mean WTP ($13.30 for EL) under the no adjustment assumption. Although statistically the mean WTP's were equal for all surveys, aggregation can create large variations in benefits between the WTP estimates. The $13.30 and $16.13 (for SL and EL respectively) both multiplied by the number in the population creates over a $10 million difference in aggregate benefits with the no adjustment approach. Although $10 million may be a considerable sum, it must be remembered that it can not be statistically attributed to the influence of information.

Information was, however, shown to have impacted the WTP function (13). When using this function in aggregation, information did influence aggregate WTP estimates. The weighting approach used here to correct for nonresponse bias generated a wider dispersion in benefit estimates than the other two aggregation techniques. Benefit estimates between the ES and SL models differed by more than $20 million, which is greater than twice the difference estimated using the no

Table 4.9. Aggregate Benefit Estimates for the Four Scenarios, by Aggregation Method

Model	Lower bound	No Adjustment	Weighted Average
EL	$28,840,800 (7.88)	$48,678,000 (13.30)	$46,701,600 (12.76)
ES	$30,487,800 (8.33)	$52,557,600 (14.36)	$42,126,600 (11.51)
SL	$30,487,800 (8.33)	$59,035,800 (16.13)	$62,293,200 (17.02)
SS	$30,927,000 (8.45)	$49,629,600 (13.56)	$45,603,600 (12.46)

KEY:

( ) = Individual Mean Willingness to Pay

Lower bound = Mean WTP calculated assuming all nonrespondents would have entered a zero WTP bid. Mean WTP is then multiplied by the relevant number in the population to derive aggregate benefits.

No adjustment = Mean WTP calculated just for those who responded to the WTP question including 0 bids. This method assumes no selection or nonresponse biases. Mean WTP is multiplied by the relevant population to generate benefit estimates

Weighted Average = This approach used the OLS equations to correct for nonresponse bias. State averages are entered into the OLS equations for all unrepresentative variables. This procedure generates adjusted mean WTP estimates. These adjusted means are then multiplied by the relevant number in the population to derive aggregate benefits.

EL = Long description of the bald eagle

ES = Short description of the bald eagle

SL = Long description of wildlife species

SS = Short description of wildlife species

adjustments approach. In other words the correction of nonresponse bias through the use of the WTP function and the weighting procedure doubled the dispersion in aggregate benefit estimates.

CHAPTER 5. Conclusions and Recommendations

5.1 Summary

This study examined one of the problems with the contingent valuation method - the information problem. The potential problem with information is two-fold. First, the quantity and complexity of information provided in the contingent market may influence the way in which an individual values the nonmarket commodity. Second, there may exist a trade-off, particularly in mail surveys, between the complexity of the contingent market and the ability of the respondent to understand the description. The problem is to be able to describe complex problems in sufficient detail without damaging the effectiveness of estimating benefits through a mail contingent valuation survey. The objective that arose out of the information problem was to examine how the quality and complexity of information provided in the contingent market influence response rates, mean WTP bids, variance of WTP bids, the WTP function, and aggregate benefit estimates.

The problem setting used to examine the information problem was the current controversy surrounding the pesticide carbofuran. This pesticide has some negative impacts on wildlife, most noticeably the bald eagle. Within this context, four different surveys were mailed to Virginia residents. Each survey contained different amounts of information on the affects of carbofuran on wildlife.

Mean WTP was not significantly impacted by the different amounts of information provided in the contingent market. WTP for the four surveys ranged from $13.30 to $16.13 per person. Response rates and WTP variances both were negatively affected by additional information. Information also had unexpected impacts on the WTP function. Different amounts of information substantially impacted variable performance in the WTP function. Aggregate benefit estimation was also influenced by the various amounts of information. These results imply that under certain conditions, discussed below, the information problem may be overstated.

5.2 Conclusions

Increasing the amount and complexity of information provided in the description of the commodity had some negative impacts on response rates, WTP variances, and the WTP function. The negative affects of additional information however do not seem to be particularly severe.

First, the amount of information did not significantly influence the respondents mean WTP bid. An interesting result that arose from the research was that the bald eagle did not seem to play large factor in determining a respondents WTP as originally hypothesized. For instance the survey SS never mentions the threat to of carbofuran the bald eagle but still generated a mean WTP of $13.56. In fact, the EL and SS possessed nearly identical mean WTP's. There are two potential explanations for this result. First individuals may be aware that the ecological impact of a pesticide is such that it can affect many different wildlife species even without explicit acknowledgement of this fact in the description of the contingent market. This suggests individuals may possess some ecological values. Given Virginians' experience with DDT, that pesticides can have a negative impact on the entire environment, may be a commonly held perception. Therefore with the descriptions that only mention the threat of carbofuran to the bald eagle, respondents may also be aware the pesticide is likely to have repercussions on other wildlife species. Another related explanation lies in the fact that the commodity is just one component of the overall policy. The policy of banning a pesticide that may be harmful to some types of wildlife is identical for all four surveys. In this instance people appear to be consistently valuing the proposed policy, a ban financed through state income taxes to protect Virginia wildlife. The results seem to confirm that individuals cannot value a commodity separately from the policy in which it is provided. In fact the policy may take on greater relative importance than the commodity.

Since willingness to pay did not seem sensitive to the level of information provided about the wildlife impacted by carbofuran, respondents may not have needed additional information on the commodity. For instance residents of Virginia have had an analogous experience with DDT. Bans on pesticides to protect wildlife may be associated with many preconceived attitudes and impressions. Although little may be known in the general populace about the specific pesticide carbofuran, there seems to be a broad based suspicion of pesticides and pesticide use in general, as evidenced by the pesticide attitude questions in the survey (see Appendix E). When the problem of carbofuran was mentioned in the hypothetical market, additional information about the wildlife affected may not have been needed by the respondents. The impact of information on WTP may therefore be greater if respondents are unfamiliar with a commodity or hypothetical policy. Thus, in cases where such prior experience exists with the commodity or policy, any additional information beyond the very minimum may not be needed. Additional studies should be undertaken to specifically test this hypothesis.

One of the arguments for the use of additional information to describe the contingent market or commodity is to decrease the variation in the WTP bids. Results found here indicate that more information about the commodity may actually increase the variation of WTP bids. This finding is contrary to results reported in previous CVM studies (Bergstrom and Stoll, 1987; and Boyle, 1988). Although it is important for the description of the commodity and market to contain the essential elements outlined in Chapter 2, results here suggest marginal increments above this basic minimum may not be needed to increase the reliability of bids. This result is thus a positive indication of the suitability of mail surveys to conduct contingent valuation work. At a more fundamental level, however, it should be noted that increased reliability in and of itself may not be an appropriate goal. If different groups of people hold dramatically different views on the commodity or the policy, then additional information describing the commodity is likely to, quite appropriately, increase the variation of the WTP bids.

One of the main concerns about the use of mail surveys in contingent valuation work is the ability of the mail instrument to handle complex, lengthy contingent scenarios. The results here indicate this may be a valid concern and limitation of the mail format. Response rates in this study were negatively affected by additional information. Thus contingent scenarios with lengthy, complex descriptions may be beyond the capacity of a mail survey. The impact of the amount of information on response rates has other important implications for the CVM, particularly in aggregation and treatment of nonrespondents. Different response rates among the survey types means that some people are choosing not to participate in the study because of the nature of the survey, and these people could have a large impact on the aggregation of benefits if their WTP were known.

Information also had a substantial impact on the WTP function. Each of the four samples were very similar demographically, but information seemed to induce different answers from respondents with similar socio-economic characteristics. This conclusion is suggested by the wide differences in variable performance across the four models. The reasons the variables performed so differently across the four models is unclear. One possible explanation is that large amounts of information may increase hypothetical bias. For the longest description, SL, WTP was in no way related to currently held attitudes about wildlife or pesticides or to similar measures (the variable NGWF). For the other three models the NGWF and other attitude variables were significantly related to WTP.

The influence of information on the WTP function also had some adverse affects on aggregate benefit estimates. Tests indicated that the four samples contained nonresponse bias. The WTP function is often used to correct for the presence of nonresponse bias. The weighting procedure used in the correction for nonresponse bias actually doubled the dispersion of aggregate estimates between the four surveys. The increased dispersion in benefits is attributable to the large differences between the four WTP functions. Reliance on the WTP function in estimating aggregate benefits can be avoided, however. If follow-up interviews gather information on nonrespondents then the use of the WTP function is unnecessary. The reader should remember that this may not be a viable option since mail surveys are generally used to avoid the expense and time of telephone or personal interviews.

5.2.1 An Additional Comment on the CVM Method

One finding that clearly emerged from examining the impact of information on a mail survey is that respondents are consistently valuing the policy of a ban on carbofuran to protect Virginia wildlife. Also, it appears that that individuals do not (cannot) value a commodity (wildlife) independently from how the commodity is provided. Hence researchers and practitioners of CVM should take great care in choosing and defining the policy and hypothetical market. A policy defined and explained in the hypothetical market should be similar to those considered and used in actual decision and policy making. Defining an unrealistic policy in the hypothetical market will generate irrelevant value information.

5.3 Recommendations

A problem often identified with mail contingent valuation surveys is that lengthy, complex scenarios may significantly impact response rates. This problem highlights the still unresolved difficultly with nonresponse and selection bias. Additional research addressing nonresponse and selection bias is needed. Current means of correcting for nonresponse bias through the use of the WTP function involves some yet unresolved problems. For instance, the WTP function may be unstable across different levels of information. Changes in information thus may lead to wide fluctuations in benefit estimation. Using the WTP function to correct for nonresponse still does not address selection bias. The only alternative to correct for nonresponse and selection bias is to contact nonrespondents through a telephone follow-up interview. Caution must also be expressed for this solution. Telephone interviews possess different strengths and weaknesses than those of a mail survey. Respondents therefore may respond differently to a telephone interview than to a mail survey. Thus biases may be introduced by the use of a telephone follow-up. Comparative research between telephone and mail contingent valuation studies would be beneficial in addressing the broader problem of nonresponse and selection bias.

The use of attitude variables in contingent valuation studies presents an excellent new avenue to examining problems associated with CVM. The attitude variables in this study suggested that hypothetical bias may increase with additional information. Because the use of attitude variables in economic studies is still relatively untested, additional studies examining the link between information and hypothetical bias should prove illuminating. The use and role of attitude variables in identifying hypothetical bias is also worth further consideration.

The literature has used OLS almost exclusively to estimate the WTP function and in aggregation. Tobit analysis however may be a preferred estimation procedure. Most CVM studies deal with limited dependent variables since WTP bids are not continuous but begin at zero and are usually truncated around zero. Use of Tobit analysis may therefore the preferred estimation technique to OLS. Future research should examine the use of Tobit for econometric analyses.

Findings in this research cast doubt on individuals' ability to value individual wildlife species. People may not possess the cognitive processes to isolate values of individual wildlife species from the entire ecological system. In fact, individuals have no reason to go through the thought processes of separating out individual values that economists often ask of them. Additional research, possibly in conjunction with psychologists, should be undertaken to examine the cognitive processes individual's go through during valuation.

One finding that seemed clear is that respondents were consistently valuing a proposed ban on carbofuran to protect wildlife. In fact, the impact of information may play a more important role in the description and definition of the hypothetical market than in the description of the commodity. Small changes in how the policy is defined may lead to significant impacts on WTP estimates. Examining the sensitivity of WTP to information in the hypothetical market would be the logical next step in accessing the impact of information on the contingent valuation method.

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Appendix A. Indirect Methods

Indirect methods use information embedded in private goods to estimate the value of nonmarket goods. Value is derived indirectly from market data. Two such methods are the Travel Cost model (TCM) and the Hedonic Pricing model (HPM). The travel cost method was first developed to value a nonmarket resource, outdoor recreation, by Clawson and Knetsch (1966). The Hedonic Pricing model was first introduced by Griliches (1971) and used in the natural resource field by Anderson and Crocker (1972).

Theoretically the indirect methods begin with the consumers utility function. The consumer will seek to maximize his utility or equivalently his level of satisfaction subject to a budget constraint. This conventional utility maximization problem begins:

$$\max U = u(X,Q). \tag{A.1}$$

$$\text{subject to: } \sum x_i p_i = Y,$$

where:

X is a vector of all private goods such that $X = (x_1, x_2.....x_n)$,

Q represents some quantity or current level of a wildlife amenity,

P is the vector of private good prices such that $P = (p_i...........p_n)$, and

Y is money income.

The solution to the utility maximization problem leads to a set of ordinary or Marshallian demand functions dependent on prices, Q and money income:

$$x_i = x_i(P,Q,Y). \tag{A.2}$$

Note that Q as an argument in the demand for private goods suggests that market data for x_i can be used to reveal welfare impact of changes in Q (Randall, 1985). Based on the discussion in Chapter 2, however, the Hicksian measure, not Marshallian is the theoretically correct measure of welfare change. In order to derive Hicksian demand functions consider the dual problem of (A.1). The consumer now is seen minimizing his expenditures or budget to achieve some given level of utility represented by:

(A.3) $$\min \sum x_i p_i,$$

$$\text{subject to: } U^0 = u(X,Q).$$

The solution to the problem now leads to the creation of the expenditure function:

(A.4) $$E = E^0(P,Q,U^0).$$

The expenditure function gives the minimum amount of expenditure E, necessary to achieve some specified level of utility, in this case U^0 . The first derivative of the expenditure function with respect to price, p^i, yields a set of Hicksian demand functions conditional on prices and utility level:

(A.5) $$x_i^h = \partial E/\partial p_i = E_{p0}(P,Q,U^0).$$

This partial derivative with respect to price gives the change in expenditure necessary to keep the individual at the reference level of welfare, U^0 for small changes in price. A similar interpretation is given for marginal changes in quantity.

Now consider a threatened nonmarginal decrement in some level of wildlife from Q^0 to Q^1 and the associated reduction in utility from U^0 to U^1. The derivative of the expenditure functions E^0 (P,Q,U^0) and $E^1(P,Q,U^1)$ with respect to Q, yields the Hicksian inverse compensated demand functions:

(A.6) $$-\partial E^0/\partial Q = E_q^0(P,Q,U^0)dQ, \text{ and } -\partial E^1/\partial Q = E_q^1(P, Q, U^1)dQ.$$

The Hicksian welfare impact of the nonmarginal decrement in Q is represented by the integral of the Hicksian inverse compensated demand curves:

(A.7) $$WTA^c = -\int_{Q^1}^{Q^0} E_q^0(P,Q,U^0)dQ,$$

and:

(A.8) $$WTP^e = -\int_{Q^1}^{Q^0} E_q^1(P,Q,U^1)dQ.$$

This formulation draws from Freeman (1979a).

The indirect methods of valuation are generally able to only estimate Marshallian demand (equation A.2) since they rely on market data (price and quantity data revealed in the market). Marshallian demand is generally good approximations to Hicksian measures. In most cases the difference between Hicksian and Marshallian measures are very small (Willig, 1976; Randall and Stoll, 1980).

Indirect methods may be capable of estimating WTP and WTA from market data for private goods, x_i as revealed through equation (A.2). For example if Q has substitute or complementary relationships with another market good x_i then the possibility of being able to use an indirect method is good. In order to use the indirect methods some conditions need to be placed on an individual's utility function.

Consider a utility function that is strongly separable:

(A.9) $$u(Q,X) = u_x(X) + u_q(Q).$$

Although Q is present in the consumer's utility function, the level of Q is completely independent of all private goods X. The marginal rates of substitution between any private, marketable goods has no effect on the level of Q. The presence of Q will not be reflected in any market data and therefore the hedonic and travel cost techniques cannot be used to reveal any benefit measure.

In the wildlife valuation area, separability may apply to a number of important cases. Wildlife species possessing only existence values (nonuse values) can be defined as separable (Freeman, 1979a; Randall, 1985). Existence value is generated by simply knowing that a wildlife species exists. For instance, an individual may derive satisfaction from knowing that an endangered species continues to exist in some remote corner of the world. Existence values are defined as separable because utility is generated by Q alone, without any interaction with market goods. If the utility function is strongly separable the contingent valuation method must be used to derive any measure of benefits.

When a wildlife species possess use values, the indirect methods can generally be used to quantify welfare change. Use values can be classified as either consumptive or nonconsumptive. The former constitutes such activities as hunting and fishing while the latter involves such activities as wildlife viewing and photography.

The next two sections of this Appendix will provide a general outline of the travel cost and hedonic methods and work done in the area of wildlife valuation for each of the methods. Important limitations and assumptions are also noted.

A1.1 Travel Cost Method

The travel cost method (TCM) estimates the value of a recreational site by using variable expenditures, such as travel costs, to estimate a site demand function. The TCM normally estimates the value of the entire recreational site instead of the site's characteristics and consequently has limited applicability in the field of wildlife valuation. It must be noted, however, that progress is being made in this area. Some early TCM work estimated the value of the Oregon salmon-steelhead sport fishery (Brown, Singh, and Castle, 1964).

The travel cost model rests ultimately on the weak complementary assumption. Weak complementary holds when the quantity demanded of some private good X is zero, the marginal utility of the nonmarket good Q is zero. That is, if a trip to a recreation site is not made the marginal utility of the site is zero. If X and Q are indeed weak complements, Q will act as a demand shiftier for X. The weak complementary assumption is necessary for the hedonic pricing model as well.

The TCM estimates the demand for the recreational site. The ordinary demand functions for a typical recreational site can be specified as follows (Freeman, 1979a):

$$V_{ij} = V_{ij}(P_V, P_X, c, t_i, h_i, Q, Y_i), \tag{A.10}$$

where:

V_{ij} = the number of visits by recreationist i to the site j,

P_v = a vector of entrance fees to various sites,

P_x = a vector of private good prices,

D_i = a vector of distances from the residence of the recreationist to various sites plus return,

c = travel costs, primarily gas,

t_i = vector of travel times to the various sites,

h_i = cost of travel time,

Q = vector of site characteristics. For example the presence of a unique wildlife population or hunting rights to some site, and

Y_i = money income for individual i.

The variables c and D are the main components of the TCM. Since the recreational site is unpriced or carries only a nominal price (entrance fee), travel cost is used as a proxy for price. The area around the recreational site is divided into circular zones. Each zone represents different travel costs to and from the site. Statistical analysis is then used to estimate the relationship between travel costs and the quantity of people choosing to visit the site. Under the assumption that the recreationist will respond to changes in travel costs the same as a change in entrance fees, the relationship becomes a demand curve. Travel costs are a proxy for a change in entrance fees and are related to quantity demanded, which is the visitation rate.

Equation (A.10) is specified for estimating the demand at multiple sites. If the sites are less than perfect substitutes, a demand function must be estimated for each site in the region. The set of equations is then simultaneously estimated. To estimate a quantity change for one site, all other equations must be held constant. Employing the TCM for multiple sites can sometimes prove to be a formidable problem. If a site is the only one of its kind in the region a single equation can be estimated.

Estimating the value of a site characteristic Q presents a more difficult problem. Q acts as a demand shifter. Suppose there is a increase in the level of Q and the demand curve shifts out. The benefits associated with the change is the area between the two ordinary demand curves integrated over the appropriate ranges. Often there is insufficient variation in Q for accurate measurement. Furthermore any associated change in Q is likely to occur over time, and in order to correctly measure the quantity change, all other variables must be held constant, which is an unlikely situation. There are also problems in accurately measuring the variable Q. For example, an accurate measure of the size and distribution of a wildlife population over time may be difficult to obtain.

Recently, progress has been made in estimating site characteristics based on the TCM, in the form of the hedonic travel cost method (HTC). Brown and Mendelsohn (1984) used the HTC to estimate the value of steelhead fish density in Washington State and Mendelsohn (1984) used the same approach to estimate the value of deer. These studies offer promising new developments to the oldest nonmarket valuation technique.

The TCM contains some other general limitations. The issue of what exactly constitutes the opportunity cost of time, h_i in equation (A.10), has not yet been resolved. The opportunity cost of time involves not only travel time but time spent at the site. The exact amount attributed to the cost of time is usually involves just a "reasonable" quess by the researcher. Improperly accounting for time costs will yield to a biased estimate of the site's benefits.

There are also problems associated with estimating the value of unique or urban sites. In such cases individuals willing to incur greater travel costs will not have to and the true value of the site will not be accurately revealed (Stoll, 1983). There is also a problem involving multipurpose trips. A typical recreational visit may involve visits to more than one recreational site. Furthermore the trip itself may be positively valued. Both problems will lead to inaccurate site estimates. The impact of congestion at the site also presents valuation problems.

A1.2 Hedonic Pricing Method

The hedonic technique derives values of nonmarket goods from information that is embedded in the price of a market good. The technique rests on the premise that for every class of goods, such as an automobile or house, there are certain distinct and separate characteristics that differentiate each unit within a class. Through price differentials within a given class it may be possible to estimate the various characteristics which comprise the good. The hedonic model has been used to value air quality from residential housing data (Brookshire, *et al.*, 1982). It was hypothesized that one of the characteristics reflected in the property values for an area was air quality. The air quality variable was found to be significant. Monthly rent differentials revealed that the impact of improvements in air quality on property values ranged from $15.44 to $45.92. These figures reflect benefits arising from air quality improvements from poor to fair.

The hedonic technique has been used to value wildlife. There are several examples were private hunting leases are bought and sold in the marketplace. Waterfowl hunting leases are sold in Maryland, Virginia, and Minnesota and the right to hunt deer is sold in Texas. Through the information revealed by the lease market, wildlife value can be derived. The hedonic technique has been used to estimate the value of Texas white-tailed deer (Livengood, 1983).

The hedonic method involves a two step process for estimating the demand function for the nonmarket good Q. First the implicit price of Q is estimated by the hedonic price technique. A private good X can be described by a vector of characteristics:

$$(A.11) \qquad P_x = P_x(C_{i1}, C_{i2}, ...C_{in})$$

Equation (A.11) is the hedonic or implicit price function. P_x is the price of the private good such as a hunting lease. The various characteristics, $P_{c_{in}}$, that define the lease could be accessibility, congestion, number of acres, and number of kills (Livengood, 1983). The marginal implicit price of any characteristic can be found by differentiating (A.11) with respect to that characteristic:

$$(A.12) \qquad \partial P_x / \partial C_{in} = P_{c_{in}}$$

The marginal implicit price, $P_{c_{in}}$ gives the increase in the expenditure on X necessary to acquire one more unit of that characteristic, ceteris paribus. If equation (A.11) is linear then the marginal implicit prices are constant for individuals. If the linearity assumption is satisfied, $P_{c_{in}}$ can be interpreted as the marginal benefit for a small change in the characteristic for each individual. In the nonlinear case, the marginal implicit price depends on the quantity of the characteristic purchased and it may be possible to estimate a demand relationship for the characteristic (Freeman, 1979b).

Only under certain instances can the demand for the characteristics be estimated. The first condition that needs to be met is for the utility function to be separable in X and for the weak complementary assumption to hold. Second, the individual is assumed to purchase only one unit of good X.

Depending on the specification of the underlying model, the demand relationship can be estimated by a number of approaches (Freeman 1979a). In one case the available quantity of goods in each model is fixed and thus individuals can be viewed as bidding on models with desired bundles of characteristics. This second step involves regressing implicit prices against observed quantities of the characteristic and income to estimate a inverse demand function:

(A.13) $$w_i = w(C_{in}, Y),$$

where $P_{c_{in}}$ is the measure for w_i, and Y is the individuals income. If the demand function can be estimated then the appropriate measure of welfare change resulting from the decrement Q_0 to Q_1 is the area between the ordinary inverse demand curves.

The major limitations to the hedonic approach are the problems associated with estimating the demand function. Furthermore, in the area of wildlife valuation there are only a limited number of related markets which allow for the implementation of the hedonic technique.

A1.3 Comparison Between the Indirect and Direct Methods

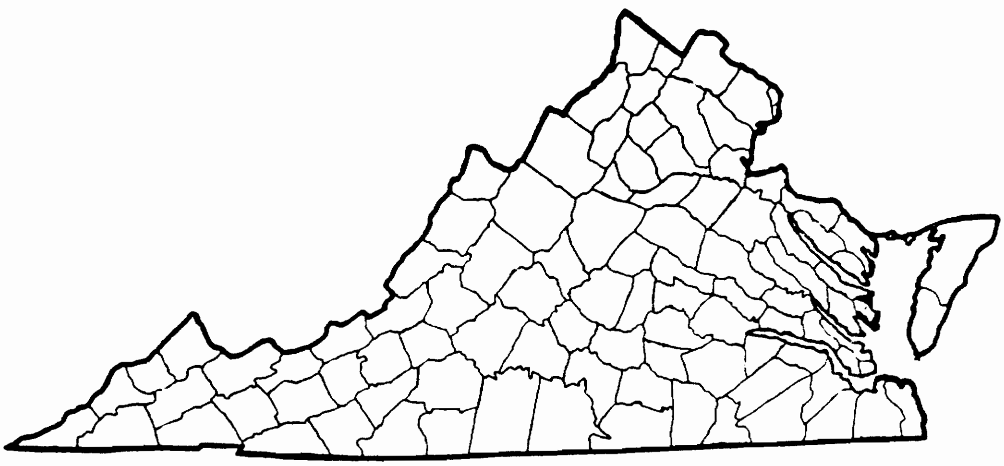
Some economists object to the contingent valuation method on the grounds that responses depend on a hypothetical situation, not actual market behavior. The CVM is subject to a wide variety of potential bias but comparisons to indirect methods could help dispel concerns about the CVM.

Thayer (1981) and Steller, Stoll, and Chavas (1985) compared the TCM and the CVM, and found that much of the apparent differences between the methods were insignificant. Brookshire et. al (1982) found very similar results comparing the CVM with the Hedonic method. Other researchers found less encouraging results. Smith, Desvousges, and Fisher (1986) cross-compared two travel cost and two contingent valuation models and found significant differences in the estimated models. The authors suggested that the lack of correspondence was at least partly due to the variation between the two travel cost models. Bishop and Heberlein (1979) compared the TCM and CVM with a simulated market. They concluded that both methods contained significant bias when compared to the simulated market results. In later findings Bishop and Heberlein (1986) again compared the CVM with a simulated market and again found significant differences between the two. The authors concluded hypothetical bias to be the problem but noted that the respondents did attempt to give genuine answers in the hypothetical market. Given these broad general conclusions the authors concluded the that the CVM is still a promising method to value environmental and other important nonmarket commodities (Bishop and Heberlein, 1986).

Appendix B. The Survey and Coding [3]

[3] Descriptions of each of the four contingent markets can be found in Chapter 3.

VIRGINIA WILDLIFE AND PESTICIDES: A SURVEY



This survey is an effort to determine how Virginia citizens feel about wildlife, agriculture and pesticides. All information is strictly confidential. Please answer all the questions. If you wish to comment on any question or express additional opinions, please feel free to use the space in the margins. Your comments will be taken into account.

Thank you for your help and effort.

Department of Agricultural Economics
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

1. Please indicate the extent you agree or disagree with each of the following statements. (circle number for each statement)

	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	NO OPINION
A) Agriculture is essential for future economic growth in Virginia	1	2	3	4	5
B) Many Virginia farmers suffer financial hardship	1	2	3	4	5
C) Agricultural pesticides are necessary for successful farming practices	1	2	3	4	5
D) Agricultural pesticides pose no risk to wildlife	1	2	3	4	5
E) Agricultural pesticides pose no health risk to people	1	2	3	4	5
F) Virginia's endangered wildlife species should be protected even if the costs are high	1	2	3	4	5

2. Do you devote time specifically to view or photograph wildlife? (circle number)

1 YES

2 NO

3. Do you feed birds or other types of wildlife at your home? (circle number)

1 YES

2 NO

4. Please identify the outdoor, wildlife, or natural history publications to which you subscribe. Please circle either YES or NO for each publication listed.

NAME OF PUBLICATION		
FIELD AND STREAM	YES	NO
OUTDOOR LIFE	YES	NO
AMERICAN HUNTER	YES	NO
DUCKS UNLIMITED	YES	NO
NATIONAL WILDLIFE	YES	NO
VIRGINIA WILDLIFE	YES	NO
AUDUBON	YES	NO
NATURAL HISTORY	YES	NO
NATIONAL GEOGRAPHIC	YES	NO

OTHER SUBSCRIPTIONS NOT LISTED: ______________________________
(PLEASE LIST) ______________________________

5. During the last 3 years, which of the following licenses have you purchased? (circle all numbers that apply)

1 VIRGINIA STATE RESIDENT HUNTING LICENSE

2 VIRGINIA STATE RESIDENT BIG GAME HUNTING LICENSE

3 FEDERAL MIGRATORY BIRD HUNTING STAMP (DUCK STAMP)

4 VIRGINIA STATE FISHING LICENSE

5 A HUNTING LICENSE FROM ANOTHER STATE

6 A FISHING LICENSE FROM ANOTHER STATE

7 NONE OF THE ABOVE

6. Do you currently own or manage a farm in Virginia that is involved in growing any of the following crops: corn, soybeans, peanuts, sorghum, alfalfa, or potatoes? (circle number)

1 YES

2 NO

7. Do you have a close friend or relative in Virginia whose main source of income depends on growing at least some of the crops mentioned in question 6? (circle number)

1 YES

2 NO

8. Do you currently own or manage a farm in Virginia or any other state that is involved in producing any of the following crops or livestock: tobacco, sheep, beef cattle, hogs, poultry, or dairy? (circle number)

1 YES

2 NO

9. Do you have a close friend or relative in Virginia or any other state whose main source of income depends on producing any of the crops or livestock mentioned in question 8? (circle number)

1 YES

2 NO

10. On your Virginia state income tax form there is a line entitled "Authorized Deductions from Refund" which gives you the opportunity to contribute part of your tax refund to the Virginia Nongame Wildlife Program. During the last 3 years, did you ever contribute part of your tax refund to the Nongame Wildlife Program? (circle number)

1 YES

2 NO

<u>This section of questions is designed to evaluate how you feel about wildlife and pesticides. Please carefully read this section and answer questions 11 and 12.</u>

Currently the pesticide Furadan is used by farmers planting corn, soybeans, peanuts, alfalfa, potatoes, and sorghum. The pesticide is very effective in protecting farmers plants and newly planted seeds from insects and worms. Furadan, however, had been a documented cause of death for several different wild animals in Virginia.

Now suppose that Virginia was considering a ban on the pesticide Furadan because of the threat to the Virginia bald eagle. The ban would be effective in preventing any more bald eagle deaths from Furadan in Virginia, but would be costly. The cost of the ban would include:

* Enforcing and monitoring the ban
* Research funding to develop substitutes to Furadan
* Programs to inform farmers of substitutes to Furadan.

11. Suppose Virginia developed a program to carry out the ban on Furadan with the costs described above. What would be the maximum amount you would be willing to pay per year in addition to your regular state income tax bill to support this program? (circle dollar value below)

0	5	10	15	20	25
30	35	40	45	50	55
60	65	70	75	80	85
90	95	100	105	110	115

OTHER: $________

If you chose a dollar value skip question 12 and go to the next section. If you circled zero please answer question 12.

12. If you circled zero, please choose the best reason for your answer. (circle number)

1 I DO NOT THINK FURADAN IS A THREAT TO THE BALD EAGLE

2 I WILL NOT PAY ANY MORE IN STATE INCOME TAXES

3 I WILL NOT PAY ANYTHING BECAUSE THE BAN WILL NOT WORK

4 FARMERS SHOULD NOT GET STATE HELP FOR NOT USING FURADAN

Finally, we would like to ask a few questions about yourself to help interpret the results

13. Please indicate the location of your Virginia residence.

________________________ COUNTY

________________________ CITY OR TOWN (if you do not live in a city or town go to the next question)

14. What is your present age? (circle number)

1 18 - 25 YEARS

2 26 - 35 YEARS

3 36 - 45 YEARS

4 46 - 55 YEARS

5 56 - 65 YEARS

6 66 - 75 YEARS

7 OVER 75 YEARS

15. Your sex (circle number):

1 MALE

2 FEMALE

16. How many people live in your household, including yourself? (circle number)

1 2 3 4 5 6 7 8 9 10 11 12 OR MORE

17. Which is the highest level of education that you have completed? (circle number)

1 8th GRADE OR UNDER
2 9th GRADE THROUGH 11th GRADE
3 COMPLETED HIGH SCHOOL
4 SOME COLLEGE
5 COMPLETED COLLEGE
6 SOME GRADUATE WORK
7 A GRADUATE DEGREE

18. What was the approximate total income of all members of your household in 1987? (circle number)

1 LESS THAN $10,000
2 10,000 TO 14,999
3 15,000 TO 19,999
4 20,000 TO 24,999
5 25,000 TO 29,999
6 30,000 TO 39,999
7 40,000 TO 49,999
8 50,000 TO 59,999
9 60,000 TO 69,999
10 OVER $70,000

We welcome any comments you may have concerning wildlife, pesticides, or this questionnaire. Feel free to write any comments you may have on the back of this questionnaire booklet.

Thank you for your time and effort.

If there is anything else you would like to tell us about wildlife and agriculture in Virginia please use this space to do so.

Also, any comments you may have concerning this survey or study is appreciated.

Your time and effort to this study is greatly appreciated. If you would like a summary of the results, please print your name and address on the back of the return envelope (NOT on the questionnaire) We will see that you get a copy.

VARIABLE CODING

SN Survey number
0 - 500 = Surveys received in the first mailing
500 - 1,000 = Surveys received in the second mailing
1,000 - 2,000 = Surveys received in the third mailing
2,000 - 3,000 = Surveys received after the telephone follow up
3,000 - 4,000 = Telephone interviews

ST Survey type
1 = Eagle long (EL)
2 = Eagle short (ES)
3 = Species Long (SL)
4 = Species short (SS)

Q1A Agriculture is essential for future economic growth in VA
1 = Strongly disagree
2 = Disagree
3 = Agree
4 = Strongly agree
2.5 = No opinion

Q1B Many VA farmers suffer financial hardship
1 = Strongly disagree
2 = Disagree
3 = Agree
4 = Strongly agree
2.5 = No opinion

Q1C Agricultural pesticides are necessary for successful farming practices.
1 = Strongly agree
2 = Agree
3 = Disagree
4 = Strongly Disagree
2.5 = No opinion

Q1D Agricultural pesticides pose no risk to wildlife
1 = Strongly agree
2 = Agree
3 = Disagree
4 = Strongly disagree
2.5 = No opinion

Q1E Agricultural pesticides pose no health risk to people
1 = Strongly agree
2 = Agree
3 = Disagree
4 = Strongly disagree
2.5 = No opinion

Q1F Virginia's endangered wildlife species should be protected even if if the costs are high
1 = Strongly disagree
2 = Disagree
3 = Agree
4 = Strongly agree
2.5 = No opinion

Q2 Do you devote time specifically to view or photograph wildlife
1 = Yes
0 = No

Q3 Do you feed birds or other types of wildlife at your home
1 = Yes
0 = No

Q4 Please identify the outdoor, wildlife or natural history publications to which you subscribe.
Field and Stream -- 1 = Yes, 0 = No
Outdoor Life -- 1 = Yes, 0 = No
American Hunter -- 1 = Yes, 0 = No
Ducks Unlimited -- 1 = Yes, 0 = No
National Wildlife -- 1 = Yes, 0 = No
Virginia Wildlife -- 1 = Yes, 0 = No
Audubon -- 1 = Yes, 0 = No
Natural History -- 1 = Yes, 0 = No
National Geographic -- 1 = Yes, 0 = No
Number of hunting and fishing magazines not listed
Number of wildlife magazines not listed

The total number of magazines were then summed to create the MAGS variable.

Q5 During the last 3 years, which of the following licenses have you purchased
Total numbers the respondent possessed

Q6 Do you currently own or manage a farm in Virginia that is involved in growing corn, soybeans, peanuts, sorghum, alfalfa, or potatoes
1 = Yes
0 = No

Q7 Do you have a close friend or relative in Virginia whose main source of income depends on growing at least some of the crops mentioned in question 6
1 = Yes
0 = No

Q8 Do you currently own or manage a farm in Virginia or any other state that is involved in producing any of the following crops or livestock: tobacco, sheep, beef cattle, hogs, poultry, or dairy
1 = Yes
0 = No

Q9 Do you have a close friend or relative in Virginia whose main source of income depends on producing any of the crops or livestock mentioned in question 8
1 = Yes
0 = No

Q10 On your Virginia state income tax form there is a line entitled "Authorized Deductions from Refund" which gives you the opportunity to contribute part of your tax refund to the Virginia Nongame Wildlife Program. During the last 3 years, did your ever contribute part of your tax refund to the Nongame Wildlife Program
1 = Yes
0 = No

Q11 What would be the maximum amount you would be willing to pay per year in addition to your regular state income tax bill to support this program

Q12 If you circled zero (in question 11) please choose the best reason for your answer

1 = Do not think Furadan is a serious threat to VA wildlife
2 = I will not pay any more in state income taxes
3 = The ban will not work
4 = Farmers should not get state help for not using Furadan
5 = Confused or do not feel qualified
6 = Refusal
7 = Chemical company should pay
8 = Do not have enough information
9 = Farmers should pay
10 = No reason for zero bid
11 = Other reasons

Q13 Location of Virginia residence

Each county and city (if applicable) was entered verbatim

Q14 What is your present age

1 = 21.5 Years
2 = 30 Years
3 = 40 Years
4 = 50 Years
5 = 60 Years
6 = 70 Years
7 = 80 Years

Q15 Your sex

1 = Male
2 = Female

Q17 Which is the highest level of education that you have completed

1 = 8th grade or under
2 = 9th grade through 11th grade
3 = Completed high school
4 = Some college
5 = Completed college
6 = Some graduate work
7 = Graduate degree

Q18 What was the approximate total income of all members of your household in 1987

1 = less than 10,000
2 = 10,000 to 15,000
3 = 15,000 to 20,000
4 = 20,000 to 25,000
5 = 25,000 to 30,000
6 = 30,000 to 40,000
7 = 40,000 to 50,000
8 = 50,000 to 60,000
9 = 60,000 to 70,000
10 = over 70,000

Appendix C. Cover Letters and Postcard Follow-up

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

Department of Agricultural Economics

Blacksburg, Virginia 24061

January 26, 1988

Name
Street Address
City, State, Zip Code

Today there are many important issues facing agriculture, such as the farm debt and soil conservation. Another important issue is agricultural pesticide management. Farmers use pesticides to protect their crops from harmful insects. Some types of pesticides, however, may be harmful to various types of wild animals. Future decisions concerning the use of agricultural pesticides could therefore affect both the farmer and the citizen of the Commonwealth.

Your household is one of a small number selected in the state of Virginia to give their opinion on this matter. Your response is important so the study can correctly represent the thinking of the people of Virginia about these issues facing agriculture and wildlife. Since your answers are important, we would like the questionnaire to be completed by an adult member of the household.

The answers you provide will be kept strictly confidential. The identification number on the return envelope is for mailing purposes only. This is so that we can check your name off the mailing list when your questionnaire is returned. Your name will never appear on or be associated with the questionnaire.

The results of this research have been requested by the responsible public agencies. We shall be happy to supply you with a summary of the results if you simply write "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do not put this information on the questionnaire itself. I would also be happy to answer any question you may have. Please write or call. My telephone number is (703) 961 - 5032.

Thank you for your assistance.

Sincerely,

Daniel Taylor

Daniel Taylor
Assistant Professor

VIRGINIA TECH

February 2, 1988

Last week a questionnaire was mailed to you seeking your opinions about some issues regarding wildlife, agriculture, and pesticides. Your household is one of a small number in the state of Virginia to give their opinions on these matters.

If you have already completed and returned it, please accept our sincere thanks. If not, please do so soon. It is important that your household also be included in the study to correctly represent the opinions of Virginia citizens.

If you did not receive the questionnaire or if it got misplaced, please call (703-961-5032) or write and I will immediately get another one in the mail to you.

Sincerely,

Daniel Taylor

Daniel Taylor
Assistant Professor

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

Department of Agricultural Economics

Blacksburg, Virginia 24061

February 16, 1988

Name
Street Address
City, State, Zip Code

About three weeks ago a questionnaire was sent to you seeking your opinions about some issues regarding Virginia wildlife, agriculture, and pesticides. As of today your completed questionnaire has not been received.

This study is being conducted because it is important that citizen opinions be taken into account in any future decisions concerning wildlife and the use of agricultural pesticides in Virginia.

I am writing you again because of the importance each questionnaire has to the usefulness of this study. Your household is one of a small number selected in Virginia to participate in this study. Only 1 out of every 900 people in Virginia are being asked to complete this questionnaire. In order for the results to accurately reflect the opinions of all Virginia residents it is essential that each household selected to participate return their questionnaire. Responses from both the farmer and nonfarmer are critical. As mentioned in the last letter, the questionnaire should be completed by one adult member of your household.

In the event that your questionnaire has been misplaced, a replacement one is enclosed.

Your cooperation is greatly appreciated.

Sincerely,

Daniel Taylor

Daniel Taylor
Assistant Professor

VIRGINIA TECH

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

Department of Agricultural Economics

Blacksburg, Virginia 24061

March 15, 1988

Name
Street Address
City, State, Zip Code

I am writing you about the questionnaire that was sent to you seeking your opinions about some issues regarding Virginia wildlife, agriculture, and pesticides. Your completed questionnaire has yet to be received.

This study is being conducted because it is important that citizen opinions be taken into account in any future decisions concerning wildlife and the use of agricultural pesticides in Virginia. The usefulnes of this study depends on how well it describes what the citizens of Virginia feel about these important matters.

In order for the results to accurately reflect the opinions of all Virginia residents it is essential that each household selected to participate return their questionnaire. In order to accomplish this goal we need the cooperation of those of you who have not yet returned the questionnaire. Responses from the farmer and nonfarmer alike are essential. As mentioned in the previous letters, the questionnaire should be completed by one adult member of your household. It should take less than 10 minutes of your time to complete this questionnaire.

We shall be happy to supply you with a summary of the results from this questionnaire if you simply write your name and address on the back of the return envelope. Please do not put this information on the questionnaire itself. Also, the answers you provide will be kept strictly confidential. The identification number on the return envelope is for mailing purposes only. This is so that we can check your name off the mailing list when your questionnaire is returned. If you have <u>any</u> questions, please write or call. My telephone number is (703) 961 - 5032.

In the event that your questionnaire has been misplaced, a replacement one is enclosed.

Your cooperation is greatly appreciated.

Sincerely,

Daniel Taylor

Daniel Taylor
Assistant Professor

VIRGINIA TECH

Appendix D. Telephone Follow-up

Hello, Is this the ______(last name)________ residence?

IF NO --The number I was calling is ____________ for the ______________ residence, did I misdial?

This is ____________ at Virginia Tech. Your address and telephone number was drawn in a random sampleof the entire state of VA. I am calling about the questionnaire we sent you a couple of weeks ago concerning Virginia agriculture, pesticides and wildlife. Have you received the questionnaire?

IF NO -- I am sorry there must have been some clerical error. This study is interested in how citizens of the Commonwealth feel about some important issues concerning pesticides and wildlife. Would you like to partipate in this study?

As you may know this study is undertaken because we believe it is important that citizens opinions be taken into account in any future decisions concerning pesticides and wildlife. We would like your opinions on these matters. As of today however we have not yet received your questionnaire. Are you considering returning it?

YES ---- Good we would appreciate if you would return it as soon as possible.

NO ---Any particular reason? REFUSAL ARGUEMENTS

If they agree to return-return the questionnaire in the prepaid envelope

If lost questionnaire we get one in the mail immediately.

NO TO MAIL----would your prefer we could ask you some questions over the telephone, it should only take about 10 minutes.

IF NO again, Thank you for you time.
(REMEMBER TO RECORD REASONS FOR REFUSAL)

GENERAL QUESTIONS

WHO IS SPONSORING (PAYING FOR) THIS SURVEY?

Sponsored by the Department of Agricultural Economics. And is being paid for by federal research funds allocated specifically for this project.

SURVEY PURPOSE

In general it concerns how we Virginians feel about pesticides and wildlife. It is designed to find out how people feel about some of the issues surrounding agriculture, pesticide use and wildlife. The information you provide will be helpful in future decisions concerning these issues.

WHO IS THE PERSON RESPONSIBLE?

The person is Dr Daniel Taylor, a researcher for the Department of Agricultural Economics here at Virginia Tech. I can have him call you or if you like you can call him at 703-961-5032

IS THIS CONFIDENTIAL? (MAIL SURVEYS)

Yes certainly. After your completed questionnaire is returned your questionnaire is put unmarked in a stack with other surveys. There is no way then to identify which questionnaire belong to you. All information released will be in the form of certain percent "yes" and a certain percent "no".

IS THIS CONFIDENTIAL? (TELEPHONE INTERVIEWS)

Yes certainly. Your responses to each question are marked on resonse cards with no identification then the answers are entered into a computor with other respondents answers. There is no way then to identify which questionnaire belongs to you. All information released will be in the form of certain percent "yes" and a certain percent "no".

COPY OF RESULTS

You can receive a copy of the results by simply writing your name and address on the back of the return envelope (or just give me your current name and address). You should receive them next month sometime.

WHO TO INTERVIEW

Any adult member of your household (over 18 years of age)

REFUSALS

NOT QUALIFIED

We are interested in every citizens opinion. There are no special qualifications, just respond on how you fee. There is no right or wrong answers.
The questions are not at all difficult. Just put what you think or feel.

TOO BUSY

-- This should only take a few minutes.
-- Sorry to have caught you at a bad time, I would be happy to cal back. When would be a good time for me to call back in the next day or two.

TOO OLD

Older people's are just as important in this particular survey as anyone else's. We need to hear from all Virginia citizens, old and young alike. We really want your opinion.

NOT INTERESTED

It is awefully important that we get opinions everyone selected for the sample, otherwise the results will be less useful. So, we'd really like to hear from you.

OBJECTS TO SURVEYS

We think this particular survey is important because the questions are ones that people in government and federal agencies would really like to know. We would really like to have your opinion also.

NO ONE ELSE'S BUSINESS WHAT I THINK

I can certainly understand, that is why all the responses you give are strictly confidential. When you return your survey your name is completely and forever separated from your survey. So when the results are released no single individual can ever be identified.

BAD HEALTH

Sorry to hear that. Have you been sick long? I would be happy call back in a day or two. Would that be ok?
--IF LENGTHY ILLNESS Excuse yourself and indicate they will not be called again.

QUESTIONS ABOUT THE SURVEY

WHAT DOES "INTERPRET THE RESULTS" MEAN?
WHY DO YOU NEED TO KNOW MY HOUSEHOLD INCOME?

Our results need to accurately reflect the opinions of all Virginians. These questions (INCOME) are needed to see if the people that we interview are similar to all Virginians. For instance if only people over 35 answer the questionnaire then we are not accurately representing citizens under 35. We need to hear from all types of citizens not just the one particular group of people.

ADDITIONAL INFO ON FURADAN AND WILDLIFE NUMBERS

Try not to give no more information about the furadan and wildlife affected than whats written on the survey.

Appendix E. Summary of Means and Frequences

KEY:

WTP	Willingness to pay
VF	Viewing and feeding activity, 0 = no activity and 2 = viewing and feeding activities.
NGWF	Contributor to the nongame wildlife fund, 0 = noncontributor and 1 = contributor
LISC	Number of hunting and fishing licenses a respondent possesses
MAGS	Number of wildlife, hunting, fishing, or natural history publications a respondent receives
F	Association with farming activity, 0 = no association and 4 = high association.
AGE	Age of the respondent in years
SEX	Gender of the respondent, 1 = male and 2 = female
INCOME	Household income of the respondent in dollars
PATT	Pesticide attitudes, where 2 = the most favorable attitude of pesticides, and 8 = the least favorable attitude of pesticides
FATT	Farming attitudes, where 2 = most positive attitude toward farming, and 8 = most negative attitude toward farming
WATT	Wildlife attitudes, where 1 = most positive attitude toward endangered species preservation, and 4 = most negative attitude toward endangered species preservation
HIGH	The highest level of education the respondent completed was high school, 0 = no and 1 = yes
SCOLL	The highest level of education the respondent completed was some college, 0 = no and 1 = yes
COLL	The highest level of education the respondent completed was college, 0 = no and 1 = yes
SGRAD	The highest level of education the respondent completed was some graduate work, 0 = no and 1 = yes
GRAD	The highest level of education the respondent completed was a graduate degree, 0 = no and 1 = yes
ELEM	The highest level of education the respondent completed was less than a high school education, 0 = no and 1 = yes
RURAL	Rural and nonrural variable, 0 = rural and 1 = nonrural

ALL RESPONDENTS

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
WTP	971	14.26879506	24.67890381	0.00000000	200.0000000
VF	969	1.28070175	0.72702348	0.00000000	2.0000000
NGWF	959	0.16266945	0.36925639	0.00000000	1.0000000
LISC	969	0.84313725	1.29132390	0.00000000	6.0000000
MAGS	966	0.97722567	1.27936957	0.00000000	7.0000000
F	972	0.81893004	1.05762480	0.00000000	4.0000000
AGE	964	47.50414938	15.63553224	21.50000000	80.0000000
SEX	964	1.27800830	0.44825006	1.00000000	2.0000000
INCOME	905	39.20994475	22.35691006	5.00000000	80.0000000
PATT	960	8.44687500	1.81719014	1.00000000	12.0000000
FATT	964	6.58143154	0.99836711	2.50000000	8.0000000
WATT	950	3.28631579	0.50822747	2.50000000	4.0000000
HIGH	972	0.20164609	0.40143584	0.00000000	1.0000000
SCOLL	972	0.25617284	0.43674312	0.00000000	1.0000000
COLL	972	0.17489712	0.38007464	0.00000000	1.0000000
SGRAD	972	0.08333333	0.27652768	0.00000000	1.0000000
GRAD	972	0.14506173	0.35234436	0.00000000	1.0000000
RURAL	955	0.46387435	0.49895453	0.00000000	1.0000000
ELEM	972	0.06481481	0.24632555	0.00000000	1.0000000

ALL RESPONDENTS

WILLINGNESS TO PAY

WTP	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	434	44.7	434	44.7
1	9	0.9	443	45.6
2	3	0.3	446	45.9
5	140	14.4	586	60.4
10	104	10.7	690	71.1
15	18	1.9	708	72.9
20	40	4.1	748	77.0
25	99	10.2	847	87.2
30	7	0.7	854	88.0
40	5	0.5	859	88.5
45	1	0.1	860	88.6
50	56	5.8	916	94.3
55	2	0.2	918	94.5
60	3	0.3	921	94.9
65	1	0.1	922	95.0
70	1	0.1	923	95.1
75	5	0.5	928	95.6
80	1	0.1	929	95.7
100	33	3.4	962	99.1
115	8	0.8	970	99.9
200	1	0.1	971	100.0

SUM VIEW OR FEED WILDLIFE AT HOME

VF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
0	158	16.3	158	16.3
1	381	39.3	539	55.6
2	430	44.4	969	100.0

NONGAME WILDLIFE FUND

NGWF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	13	.	.	.
0	803	83.7	803	83.7
1	156	16.3	959	100.0

ALL RESPONDENTS

NUMBER OF LISCENCES

LISC	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
0	602	62.1	602	62.1
1	131	13.5	733	75.6
2	83	8.6	816	84.2
3	107	11.0	923	95.3
4	34	3.5	957	98.8
5	9	0.9	966	99.7
6	3	0.3	969	100.0

TOTAL MAGAZINES

MAGS	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	6	.	.	.
0	461	47.7	461	47.7
1	264	27.3	725	75.1
2	132	13.7	857	88.7
3	57	5.9	914	94.6
4	28	2.9	942	97.5
5	14	1.4	956	99.0
6	7	0.7	963	99.7
7	3	0.3	966	100.0

ASSOCIATION WITH FARMING

F	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	534	54.9	534	54.9
1	166	17.1	700	72.0
2	213	21.9	913	93.9
3	32	3.3	945	97.2
4	27	2.8	972	100.0

ALL RESPONDENTS

AGE IN YEARS

AGE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	8	.	.	.
21.5	45	4.7	45	4.7
30.5	214	22.2	259	26.9
40.5	231	24.0	490	50.8
50.5	168	17.4	658	68.3
60.5	155	16.1	813	84.3
70.5	105	10.9	918	95.2
80	46	4.8	964	100.0

GENDER

SEX	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	8	.	.	.
1	696	72.2	696	72.2
2	268	27.8	964	100.0

TOTAL DOLLARS 1987 HH INCOME

INCOME	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	67	.	.	.
5	79	8.7	79	8.7
12.5	53	5.9	132	14.6
17.5	76	8.4	208	23.0
22.5	66	7.3	274	30.3
27.5	75	8.3	349	38.6
35	154	17.0	503	55.6
45	138	15.2	641	70.8
55	86	9.5	727	80.3
65	68	7.5	795	87.8
80	110	12.2	905	100.0

RURAL / NONRURAL

RURAL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	17	.	.	.
0	512	53.6	512	53.6
1	443	46.4	955	100.0

ALL RESPONDENTS

PESTICIDE ATTITUDES

PATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	12	.	.	.
1	3	0.3	3	0.3
3	10	1.0	13	1.4
3.5	2	0.2	15	1.6
4	12	1.3	27	2.8
5	21	2.2	48	5.0
5.5	2	0.2	50	5.2
6	51	5.3	101	10.5
6.5	16	1.7	117	12.2
7	97	10.1	214	22.3
7.5	35	3.6	249	25.9
8	285	29.7	534	55.6
8.5	34	3.5	568	59.2
9	109	11.4	677	70.5
9.5	4	0.4	681	70.9
10	128	13.3	809	84.3
10.5	17	1.8	826	86.0
11	101	10.5	927	96.6
12	33	3.4	960	100.0

FARMING ATTITUDES

FATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	8	.	.	.
2.5	2	0.2	2	0.2
3	13	1.3	15	1.6
4	9	0.9	24	2.5
5	25	2.6	49	5.1
5.5	85	8.8	134	13.9
6	308	32.0	442	45.9
6.5	40	4.1	482	50.0
7	292	30.3	774	80.3
8	190	19.7	964	100.0

WILDLIFE ATTITUDES

WATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	22	.	.	.
2.5	68	7.2	68	7.2
3	576	60.6	644	67.8
4	306	32.2	950	100.0

ALL RESPONDENTS

HIGH SCHOOL GRAD

HIGH	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	776	79.8	776	79.8
1	196	20.2	972	100.0

SOME COLLEGE

SCOLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	723	74.4	723	74.4
1	249	25.6	972	100.0

COLLEGE GRAD

COLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	802	82.5	802	82.5
1	170	17.5	972	100.0

SOME GRADUATE EDUCATION

SGRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	891	91.7	891	91.7
1	81	8.3	972	100.0

GRADUATE DEGREE

GRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	831	85.5	831	85.5
1	141	14.5	972	100.0

NOT HIGH SCHOOL GRADUATE

ELEM	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	909	93.5	909	93.5
1	63	6.5	972	100.0

EAGLE LONG (EL)

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
WTP	250	13.30000000	23.03014438	0.00000000	115.0000000
VF	250	1.28400000	0.73039572	0.00000000	2.0000000
NGWF	249	0.18473896	0.38886730	0.00000000	1.0000000
LISC	250	0.83600000	1.28362564	0.00000000	6.0000000
MAGS	249	0.91967871	1.18184106	0.00000000	7.0000000
F	250	0.76000000	1.03279556	0.00000000	4.0000000
AGE	248	47.94758065	16.37055945	21.50000000	80.0000000
SEX	249	1.23694779	0.42606641	1.00000000	2.0000000
INCOME	234	39.17735043	22.24863307	5.00000000	80.0000000
PATT	247	8.31174089	1.78350157	1.00000000	12.0000000
FATT	249	6.57228916	0.95397892	3.00000000	8.0000000
WATT	245	3.28571429	0.51014302	2.50000000	4.0000000
HIGH	250	0.22800000	0.42038422	0.00000000	1.0000000
SCOLL	250	0.27200000	0.44588255	0.00000000	1.0000000
COLL	250	0.16000000	0.36734147	0.00000000	1.0000000
SGRAD	250	0.10000000	0.30060181	0.00000000	1.0000000
GRAD	250	0.11200000	0.31599908	0.00000000	1.0000000
RURAL	247	0.44129555	0.49755004	0.00000000	1.0000000
ELEM	250	0.05600000	0.23038295	0.00000000	1.0000000

EAGLE LONG (EL)

WILLINGNESS TO PAY

WTP	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	107	42.8	107	42.8
1	6	2.4	113	45.2
2	2	0.8	115	46.0
5	40	16.0	155	62.0
10	27	10.8	182	72.8
15	3	1.2	185	74.0
20	10	4.0	195	78.0
25	27	10.8	222	88.8
40	1	0.4	223	89.2
50	15	6.0	238	95.2
55	1	0.4	239	95.6
60	1	0.4	240	96.0
75	1	0.4	241	96.4
100	6	2.4	247	98.8
115	3	1.2	250	100.0

SUM VIEW OR FEED WILDLIFE AT HOME

VF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	41	16.4	41	16.4
1	97	38.8	138	55.2
2	112	44.8	250	100.0

NONGAME WILDLIFE FUND

NGWF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	203	81.5	203	81.5
1	46	18.5	249	100.0

NUMBER OF LISCENCES

LISC	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	156	62.4	156	62.4
1	30	12.0	186	74.4
2	29	11.6	215	86.0
3	24	9.6	239	95.6
4	7	2.8	246	98.4
5	3	1.2	249	99.6
6	1	0.4	250	100.0

EAGLE LONG (EL)

TOTAL MAGAZINES

MAGS	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	123	49.4	123	49.4
1	62	24.9	185	74.3
2	38	15.3	223	89.6
3	19	7.6	242	97.2
4	3	1.2	245	98.4
5	3	1.2	248	99.6
7	1	0.4	249	100.0

ASSOCIATION WITH FARMING

F	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	142	56.8	142	56.8
1	47	18.8	189	75.6
2	47	18.8	236	94.4
3	7	2.8	243	97.2
4	7	2.8	250	100.0

AGE IN YEARS

AGE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
21.5	6	2.4	6	2.4
30.5	64	25.8	70	28.2
40.5	62	25.0	132	53.2
50.5	38	15.3	170	68.5
60.5	29	11.7	199	80.2
70.5	31	12.5	230	92.7
80	18	7.3	248	100.0

GENDER

SEX	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
1	190	76.3	190	76.3
2	59	23.7	249	100.0

EAGLE LONG (EL)

TOTAL DOLLARS 1987 HH INCOME

INCOME	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	16	.	.	.
5	16	6.8	16	6.8
12.5	14	6.0	30	12.8
17.5	26	11.1	56	23.9
22.5	19	8.1	75	32.1
27.5	20	8.5	95	40.6
35	37	15.8	132	56.4
45	31	13.2	163	69.7
55	23	9.8	186	79.5
65	21	9.0	207	88.5
80	27	11.5	234	100.0

PESTICIDE ATTITUDES

PATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
1	1	0.4	1	0.4
3	2	0.8	3	1.2
4	3	1.2	6	2.4
5	8	3.2	14	5.7
6	17	6.9	31	12.6
6.5	5	2.0	36	14.6
7	28	11.3	64	25.9
7.5	5	2.0	69	27.9
8	73	29.6	142	57.5
8.5	8	3.2	150	60.7
9	31	12.6	181	73.3
10	33	13.4	214	86.6
10.5	4	1.6	218	88.3
11	25	10.1	243	98.4
12	4	1.6	247	100.0

FARMING ATTITUDES

FATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
3	2	0.8	2	0.8
4	4	1.6	6	2.4
5	5	2.0	11	4.4
5.5	24	9.6	35	14.1
6	80	32.1	115	46.2
6.5	13	5.2	128	51.4
7	75	30.1	203	81.5
8	46	18.5	249	100.0

EAGLE LONG (EL)

WILDLIFE ATTITUDES

WATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	5	.	.	.
2.5	18	7.3	18	7.3
3	148	60.4	166	67.8
4	79	32.2	245	100.0

HIGH SCHOOL GRAD

HIGH	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	193	77.2	193	77.2
1	57	22.8	250	100.0

SOME COLLEGE

SCOLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	182	72.8	182	72.8
1	68	27.2	250	100.0

COLLEGE GRAD

COLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	210	84.0	210	84.0
1	40	16.0	250	100.0

SOME GRADUATE EDUCATION

SGRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	225	90.0	225	90.0
1	25	10.0	250	100.0

EAGLE LONG (EL)

GRADUATE DEGREE

GRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	222	88.8	222	88.8
1	28	11.2	250	100.0

RURAL / NONRURAL

RURAL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
0	138	55.9	138	55.9
1	109	44.1	247	100.0

NOT HIGH SCHOOL GRADUATE

ELEM	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	236	94.4	236	94.4
1	14	5.6	250	100.0

EAGLE SHORT (ES)

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
WTP	243	14.36213992	24.50553418	0.00000000	115.0000000
VF	243	1.18106996	0.72166280	0.00000000	2.0000000
NGWF	236	0.16101695	0.36832777	0.00000000	1.0000000
LISC	243	0.81069959	1.29731474	0.00000000	6.0000000
MAGS	243	1.00411523	1.39212051	0.00000000	7.0000000
F	244	0.83196721	1.09264405	0.00000000	4.0000000
AGE	242	47.63636364	15.06947947	21.50000000	80.0000000
SEX	242	1.28512397	0.45240916	1.00000000	2.0000000
INCOME	233	39.75321888	21.89852775	5.00000000	80.0000000
PATT	242	8.50826446	1.81565743	1.00000000	12.0000000
FATT	242	6.57851240	0.97160573	3.00000000	8.0000000
WATT	240	3.27500000	0.51280670	2.50000000	4.0000000
HIGH	244	0.20081967	0.40143691	0.00000000	1.0000000
SCOLL	244	0.26229508	0.44078640	0.00000000	1.0000000
COLL	244	0.15163934	0.35940820	0.00000000	1.0000000
SGRAD	244	0.09426230	0.29279389	0.00000000	1.0000000
GRAD	244	0.15573770	0.36335184	0.00000000	1.0000000
RURAL	241	0.46473029	0.49979249	0.00000000	1.0000000
ELEM	244	0.07377049	0.26193433	0.00000000	1.0000000

EAGLE SHORT (ES)

WILLINGNESS TO PAY

WTP	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	105	43.2	105	43.2
5	43	17.7	148	60.9
10	27	11.1	175	72.0
15	4	1.6	179	73.7
20	8	3.3	187	77.0
25	24	9.9	211	86.8
30	3	1.2	214	88.1
40	1	0.4	215	88.5
45	1	0.4	216	88.9
50	12	4.9	228	93.8
55	1	0.4	229	94.2
60	1	0.4	230	94.7
80	1	0.4	231	95.1
100	11	4.5	242	99.6
115	1	0.4	243	100.0

SUM VIEW OR FEED WILDLIFE AT HOME

VF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	45	18.5	45	18.5
1	109	44.9	154	63.4
2	89	36.6	243	100.0

NONGAME WILDLIFE FUND

NGWF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	8	.	.	.
0	198	83.9	198	83.9
1	38	16.1	236	100.0

EAGLE SHORT (ES)

NUMBER OF LISCENCES

LISC	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	155	63.8	155	63.8
1	34	14.0	189	77.8
2	15	6.2	204	84.0
3	27	11.1	231	95.1
4	9	3.7	240	98.8
5	2	0.8	242	99.6
6	1	0.4	243	100.0

TOTAL MAGAZINES

MAGS	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	1	.	.	.
0	117	48.1	117	48.1
1	73	30.0	190	78.2
2	19	7.8	209	86.0
3	17	7.0	226	93.0
4	9	3.7	235	96.7
5	3	1.2	238	97.9
6	4	1.6	242	99.6
7	1	0.4	243	100.0

ASSOCIATION WITH FARMING

F	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	133	54.5	133	54.5
1	45	18.4	178	73.0
2	50	20.5	228	93.4
3	6	2.5	234	95.9
4	10	4.1	244	100.0

EAGLE SHORT (ES)

AGE IN YEARS

AGE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
21.5	11	4.5	11	4.5
30.5	51	21.1	62	25.6
40.5	55	22.7	117	48.3
50.5	46	19.0	163	67.4
60.5	46	19.0	209	86.4
70.5	25	10.3	234	96.7
80	8	3.3	242	100.0

GENDER

SEX	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
1	173	71.5	173	71.5
2	69	28.5	242	100.0

TOTAL DOLLARS 1987 HH INCOME

INCOME	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	11	.	.	.
5	18	7.7	18	7.7
12.5	11	4.7	29	12.4
17.5	20	8.6	49	21.0
22.5	17	7.3	66	28.3
27.5	19	8.2	85	36.5
35	43	18.5	128	54.9
45	37	15.9	165	70.8
55	23	9.9	188	80.7
65	17	7.3	205	88.0
80	28	12.0	233	100.0

EAGLE SHORT (ES)

RURAL / NONRURAL

RURAL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
0	129	53.5	129	53.5
1	112	46.5	241	100.0

EAGLE SHORT (ES)

PESTICIDE ATTITUDES

PATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
1	1	0.4	1	0.4
3	1	0.4	2	0.8
3.5	1	0.4	3	1.2
4	4	1.7	7	2.9
5	4	1.7	11	4.5
6	12	5.0	23	9.5
6.5	3	1.2	26	10.7
7	24	9.9	50	20.7
7.5	11	4.5	61	25.2
8	73	30.2	134	55.4
8.5	11	4.5	145	59.9
9	19	7.9	164	67.8
9.5	2	0.8	166	68.6
10	39	16.1	205	84.7
10.5	4	1.7	209	86.4
11	22	9.1	231	95.5
12	11	4.5	242	100.0

FARMING ATTITUDES

FATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
3	3	1.2	3	1.2
4	2	0.8	5	2.1
5	8	3.3	13	5.4
5.5	24	9.9	37	15.3
6	70	28.9	107	44.2
6.5	14	5.8	121	50.0
7	76	31.4	197	81.4
8	45	18.6	242	100.0

WILDLIFE ATTITUDES

WATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	4	.	.	.
2.5	20	8.3	20	8.3
3	144	60.0	164	68.3
4	76	31.7	240	100.0

EAGLE SHORT (ES)

HIGH SCHOOL GRAD

HIGH	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	195	79.9	195	79.9
1	49	20.1	244	100.0

SOME COLLEGE

SCOLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	180	73.8	180	73.8
1	64	26.2	244	100.0

COLLEGE GRAD

COLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	207	84.8	207	84.8
1	37	15.2	244	100.0

SOME GRADUATE EDUCATION

SGRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	221	90.6	221	90.6
1	23	9.4	244	100.0

GRADUATE DEGREE

GRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	206	84.4	206	84.4
1	38	15.6	244	100.0

NOT HIGH SCHOOL GRADUATE

ELEM	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	226	92.6	226	92.6
1	18	7.4	244	100.0

SPECIES LONG (SL)

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
WTP	217	16.12903226	27.07144073	0.00000000	200.0000000
VF	215	1.34418605	0.73156545	0.00000000	2.0000000
NGWF	215	0.15813953	0.36572330	0.00000000	1.0000000
LISC	215	0.97209302	1.31815603	0.00000000	5.0000000
MAGS	215	0.94883721	1.21216037	0.00000000	7.0000000
F	217	0.85714286	1.03317971	0.00000000	4.0000000
AGE	213	46.73004695	14.90603077	21.50000000	80.0000000
SEX	214	1.27102804	0.44553272	1.00000000	2.0000000
INCOME	197	37.50000000	21.08958056	5.00000000	80.0000000
PATT	214	8.57476636	1.84021807	3.00000000	12.0000000
FATT	214	6.70794393	1.04476449	2.50000000	8.0000000
WATT	210	3.31666667	0.49248742	2.50000000	4.0000000
HIGH	217	0.20737327	0.40636261	0.00000000	1.0000000
SCOLL	217	0.25806452	0.43858140	0.00000000	1.0000000
COLL	217	0.17511521	0.38094438	0.00000000	1.0000000
SGRAD	217	0.07373272	0.26193967	0.00000000	1.0000000
GRAD	217	0.13824885	0.34595904	0.00000000	1.0000000
RURAL	211	0.45971564	0.49955972	0.00000000	1.0000000
ELEM	217	0.06912442	0.25425211	0.00000000	1.0000000

SPECIES LONG (SL)

WILLINGNESS TO PAY

WTP	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	96	44.2	96	44.2
5	27	12.4	123	56.7
10	22	10.1	145	66.8
15	5	2.3	150	69.1
20	10	4.6	160	73.7
25	22	10.1	182	83.9
30	3	1.4	185	85.3
40	1	0.5	186	85.7
50	19	8.8	205	94.5
65	1	0.5	206	94.9
70	1	0.5	207	95.4
75	1	0.5	208	95.9
100	6	2.8	214	98.6
115	2	0.9	216	99.5
200	1	0.5	217	100.0

SUM VIEW OR FEED WILDLIFE AT HOME

VF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
0	33	15.3	33	15.3
1	75	34.9	108	50.2
2	107	49.8	215	100.0

NONGAME WILDLIFE FUND

NGWF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
0	181	84.2	181	84.2
1	34	15.8	215	100.0

SPECIES LONG (SL)

NUMBER OF LISCENCES

LISC	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
0	121	56.3	121	56.3
1	32	14.9	153	71.2
2	22	10.2	175	81.4
3	29	13.5	204	94.9
4	9	4.2	213	99.1
5	2	0.9	215	100.0

TOTAL MAGAZINES

MAGS	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
0	100	46.5	100	46.5
1	63	29.3	163	75.8
2	32	14.9	195	90.7
3	9	4.2	204	94.9
4	7	3.3	211	98.1
5	3	1.4	214	99.5
7	1	0.5	215	100.0

ASSOCIATION WITH FARMING

F	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	114	52.5	114	52.5
1	36	16.6	150	69.1
2	54	24.9	204	94.0
3	10	4.6	214	98.6
4	3	1.4	217	100.0

AGE IN YEARS

AGE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	4	.	.	.
21.5	10	4.7	10	4.7
30.5	47	22.1	57	26.8
40.5	54	25.4	111	52.1
50.5	39	18.3	150	70.4
60.5	35	16.4	185	86.9
70.5	22	10.3	207	97.2
80	6	2.8	213	100.0

SPECIES LONG (SL)

GENDER

SEX	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
1	156	72.9	156	72.9
2	58	27.1	214	100.0

TOTAL DOLLARS 1987 HH INCOME

INCOME	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	20	.	.	.
5	19	9.6	19	9.6
12.5	14	7.1	33	16.8
17.5	9	4.6	42	21.3
22.5	18	9.1	60	30.5
27.5	16	8.1	76	38.6
35	38	19.3	114	57.9
45	34	17.3	148	75.1
55	20	10.2	168	85.3
65	11	5.6	179	90.9
80	18	9.1	197	100.0

PESTICIDE ATTITUDES

PATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
3	4	1.9	4	1.9
4	2	0.9	6	2.8
5	4	1.9	10	4.7
6	9	4.2	19	8.9
6.5	3	1.4	22	10.3
7	22	10.3	44	20.6
7.5	10	4.7	54	25.2
8	60	28.0	114	53.3
8.5	6	2.8	120	56.1
9	26	12.1	146	68.2
9.5	1	0.5	147	68.7
10	27	12.6	174	81.3
10.5	4	1.9	178	83.2
11	26	12.1	204	95.3
12	10	4.7	214	100.0

SPECIES LONG (SL)

FARMING ATTITUDES

FATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	3	.	.	.
2.5	2	0.9	2	0.9
3	3	1.4	5	2.3
4	1	0.5	6	2.8
5	3	1.4	9	4.2
5.5	11	5.1	20	9.3
6	64	29.9	84	39.3
6.5	6	2.8	90	42.1
7	73	34.1	163	76.2
8	51	23.8	214	100.0

WILDLIFE ATTITUDES

WATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	7	.	.	.
2.5	7	3.3	7	3.3
3	133	63.3	140	66.7
4	70	33.3	210	100.0

HIGH SCHOOL GRAD

HIGH	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	172	79.3	172	79.3
1	45	20.7	217	100.0

SOME COLLEGE

SCOLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	161	74.2	161	74.2
1	56	25.8	217	100.0

COLLEGE GRAD

COLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	179	82.5	179	82.5
1	38	17.5	217	100.0

SPECIES LONG (SL)

SOME GRADUATE EDUCATION

SGRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	201	92.6	201	92.6
1	16	7.4	217	100.0

GRADUATE DEGREE

GRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	187	86.2	187	86.2
1	30	13.8	217	100.0

RURAL / NONRURAL

RURAL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	6	.	.	.
0	114	54.0	114	54.0
1	97	46.0	211	100.0

NOT HIGH SCHOOL GRADUATE

ELEM	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	202	93.1	202	93.1
1	15	6.9	217	100.0

SPECIES SHORT (SS)

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE
WTP	261	13.56321839	24.33486000	0.00000000	115.0000000
VF	261	1.31800766	0.71952272	0.00000000	2.0000000
NGWF	259	0.14671815	0.35450976	0.00000000	1.0000000
LISC	261	0.77394636	1.27046756	0.00000000	6.0000000
MAGS	259	1.03088803	1.31737479	0.00000000	6.0000000
F	261	0.83141762	1.07163135	0.00000000	4.0000000
AGE	261	47.59195402	16.07844868	21.50000000	80.0000000
SEX	259	1.31660232	0.46605141	1.00000000	2.0000000
INCOME	241	40.11410788	23.91309021	5.00000000	80.0000000
PATT	257	8.41245136	1.83209255	1.00000000	12.0000000
FATT	259	6.48841699	1.02007989	3.00000000	8.0000000
WATT	255	3.27254902	0.51668173	2.50000000	4.0000000
HIGH	261	0.17241379	0.37846542	0.00000000	1.0000000
SCOLL	261	0.23371648	0.42400696	0.00000000	1.0000000
COLL	261	0.21072797	0.40860909	0.00000000	1.0000000
SGRAD	261	0.06513410	0.24723642	0.00000000	1.0000000
GRAD	261	0.17241379	0.37846542	0.00000000	1.0000000
RURAL	256	0.48828125	0.50084182	0.00000000	1.0000000
ELEM	261	0.06130268	0.24034556	0.00000000	1.0000000

SPECIES SHORT (SS)

WILLINGNESS TO PAY

WTP	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	126	48.3	126	48.3
1	3	1.1	129	49.4
2	1	0.4	130	49.8
5	30	11.5	160	61.3
10	28	10.7	188	72.0
15	6	2.3	194	74.3
20	12	4.6	206	78.9
25	26	10.0	232	88.9
30	1	0.4	233	89.3
40	2	0.8	235	90.0
50	10	3.8	245	93.9
60	1	0.4	246	94.3
75	3	1.1	249	95.4
100	10	3.8	259	99.2
115	2	0.8	261	100.0

SUM VIEW OR FEED WILDLIFE AT HOME

VF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	39	14.9	39	14.9
1	100	38.3	139	53.3
2	122	46.7	261	100.0

NONGAME WILDLIFE FUND

NGWF	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
0	221	85.3	221	85.3
1	38	14.7	259	100.0

NUMBER OF LISCENCES

LISC	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	170	65.1	170	65.1
1	35	13.4	205	78.5
2	17	6.5	222	85.1
3	27	10.3	249	95.4
4	9	3.4	258	98.9
5	2	0.8	260	99.6
6	1	0.4	261	100.0

SPECIES SHORT (SS)

TOTAL MAGAZINES

MAGS	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
0	121	46.7	121	46.7
1	66	25.5	187	72.2
2	43	16.6	230	88.8
3	12	4.6	242	93.4
4	9	3.5	251	96.9
5	5	1.9	256	98.8
6	3	1.2	259	100.0

ASSOCIATION WITH FARMING

F	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	145	55.6	145	55.6
1	38	14.6	183	70.1
2	62	23.8	245	93.9
3	9	3.4	254	97.3
4	7	2.7	261	100.0

AGE IN YEARS

AGE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
21.5	18	6.9	18	6.9
30.5	52	19.9	70	26.8
40.5	60	23.0	130	49.8
50.5	45	17.2	175	67.0
60.5	45	17.2	220	84.3
70.5	27	10.3	247	94.6
80	14	5.4	261	100.0

GENDER

SEX	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
1	177	68.3	177	68.3
2	82	31.7	259	100.0

SPECIES SHORT (SS)

TOTAL DOLLARS 1987 HH INCOME

INCOME	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	20	.	.	.
5	26	10.8	26	10.8
12.5	14	5.8	40	16.6
17.5	21	8.7	61	25.3
22.5	12	5.0	73	30.3
27.5	20	8.3	93	38.6
35	36	14.9	129	53.5
45	36	14.9	165	68.5
55	20	8.3	185	76.8
65	19	7.9	204	84.6
80	37	15.4	241	100.0

PESTICIDE ATTITUDES

PATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	4	.	.	.
1	1	0.4	1	0.4
3	3	1.2	4	1.6
3.5	1	0.4	5	1.9
4	3	1.2	8	3.1
5	5	1.9	13	5.1
5.5	2	0.8	15	5.8
6	13	5.1	28	10.9
6.5	5	1.9	33	12.8
7	23	8.9	56	21.8
7.5	9	3.5	65	25.3
8	79	30.7	144	56.0
8.5	9	3.5	153	59.5
9	33	12.8	186	72.4
9.5	1	0.4	187	72.8
10	29	11.3	216	84.0
10.5	5	1.9	221	86.0
11	28	10.9	249	96.9
12	8	3.1	257	100.0

SPECIES SHORT (SS)

FARMING ATTITUDES

FATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	2	.	.	.
3	5	1.9	5	1.9
4	2	0.8	7	2.7
5	9	3.5	16	6.2
5.5	26	10.0	42	16.2
6	94	36.3	136	52.5
6.5	7	2.7	143	55.2
7	68	26.3	211	81.5
8	48	18.5	259	100.0

WILDLIFE ATTITUDES

WATT	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	6	.	.	.
2.5	23	9.0	23	9.0
3	151	59.2	174	68.2
4	81	31.8	255	100.0

HIGH SCHOOL GRAD

HIGH	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	216	82.8	216	82.8
1	45	17.2	261	100.0

SOME COLLEGE

SCOLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	200	76.6	200	76.6
1	61	23.4	261	100.0

COLLEGE GRAD

COLL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	206	78.9	206	78.9
1	55	21.1	261	100.0

SPECIES SHORT (SS)

SOME GRADUATE EDUCATION

SGRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	244	93.5	244	93.5
1	17	6.5	261	100.0

GRADUATE DEGREE

GRAD	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	216	82.8	216	82.8
1	45	17.2	261	100.0

RURAL / NONRURAL

RURAL	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
.	5	.	.	.
0	131	51.2	131	51.2
1	125	48.8	256	100.0

NOT HIGH SCHOOL GRADUATE

ELEM	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
0	245	93.9	245	93.9
1	16	6.1	261	100.0

Appendix F. Summary of Data[4]

[4] See Appendix B for an explanation of the coding of the survey data.

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
1	.	4.0	4.0	1.0	4.0	4.0	4.0	1	1	1	2	0	0	0	0	1	0	2	henrico	4	1	3	4	4
1	2	3.0	3.0	2.5	3.0	3.0	3.0	1	1	4	0	0	0	0	0	0	25	.	fairfax	5	1	2	6	10
1	3	2.5	3.0	2.5	3.0	3.0	2.5	1	0	1	0	0	0	0	0	0	5	.	fairfax	3	1	5	7	9
1	5	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	0	0	0	0	0	0	5	fairfax	4	1	2	7	.
1	14	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	1	0	1	0	5	.	fairfax	3	2	2	5	5
1	22	3.0	3.0	2.0	4.0	3.0	3.0	0	0	0	0	0	0	0	0	0	20	.	fairfax	7	1	2	7	10
1	34	3.0	2.5	2.0	4.0	4.0	3.0	0	0	1	0	0	0	0	0	1	25	.	fairfax	4	1	3	6	10
1	38	3.0	3.0	3.0	4.0	4.0	4.0	1	1	2	1	0	0	0	0	1	50	.	fairfax	2	2	3	4	8
1	40	3.0	3.0	2.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	25	.	fairfax	2	2	2	4	10
1	42	4.0	2.5	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	4	fairfax	6	1	2	6	10
1	59	3.0	3.0	3.0	4.0	4.0	3.0	1	1	0	0	0	0	0	0	0	0	2	fairfax	3	2	3	5	8
1	60	4.0	2.5	3.0	4.0	3.0	4.0	1	1	1	0	0	0	0	0	0	10	.	fairfax	3	1	4	6	9
1	61	4.0	3.0	2.0	3.0	3.0	4.0	1	1	3	0	0	0	0	0	0	115	.	loudoun	3	2	4	7	10
1	63	4.0	3.0	1.0	3.0	3.0	4.0	1	1	2	0	0	0	0	0	1	50	.	fauquier	4	1	2	3	7
1	64	3.0	3.0	3.0	4.0	4.0	4.0	0	1	3	1	0	0	0	1	0	25	.	fairfax	4	2	4	6	9
1	65	4.0	3.0	3.0	4.0	4.0	4.0	1	1	3	0	0	0	0	0	1	100	.	fairfax	2	2	2	7	10
1	71	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	25	.	prince william	3	1	6	5	7
1	72	2.5	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	1	10	.	prince william	2	1	5	6	6
1	79	2.5	2.5	2.0	3.0	3.0	3.0	1	0	1	0	0	0	0	1	0	0	2	arlington	3	1	1	7	8
1	82	4.0	2.5	2.0	4.0	4.0	4.0	0	0	0	0	0	0	0	0	0	5	.	fairfax	2	1	2	7	5
1	88	3.0	3.0	2.0	4.0	4.0	4.0	1	0	4	6	0	1	0	1	1	0	6	arlington	2	1	1	7	.
1	89	3.0	2.5	2.0	4.0	3.0	3.0	1	1	3	0	0	0	0	0	1	5	.	fairfax	5	1	2	7	8
1	90	2.5	3.0	2.0	4.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	fairfax	5	2	3	5	8
1	91	4.0	3.0	2.0	2.5	2.5	3.0	0	0	1	0	0	0	0	0	0	0	2	arlington	7	2	2	4	6
1	93	3.0	4.0	2.0	4.0	4.0	4.0	1	0	0	0	0	1	0	1	1	40	.	arlington	1	1	2	6	2
1	96	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	50	.	fairfax	3	2	1	5	4
1	100	3.0	2.5	3.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	1	100	.	fairfax	3	2	3	7	10
1	101	3.0	3.0	2.0	4.0	4.0	4.0	1	1	2	1	0	0	0	1	0	5	.	arlington	2	1	3	5	5
1	110	3.0	2.5	2.0	2.5	2.5	2.5	0	0	0	0	0	0	0	0	0	0	2	fairfax	4	1	3	5	7
1	116	3.0	3.0		2.5	2.5	3.0	1	1	0	0	0	0	0	0	0	5	.	fairfax	6	2	1	4	2
1	120	3.0	2.5	2.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	1	50	.	spotsylvania	3	1	4	7	9
1	123	4.0	2.5	3.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	2	stafford	2	1	2	4	5
1	136	4.0	3.0	2.0	3.0	3.0	4.0	1	1	1	0	0	1	0	1	1	50	.	frederick	3	1	3	5	7
1	147	3.0	3.0	2.5	4.0	4.0	4.0	1	1	0	2	0	0	0	1	0	5	.	madison	.	1	3	3	3
1	149	3.0	2.5	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	10	rockingham	6	1	1	3	6
1	153	4.0	3.0	2.5	4.0	4.0	3.0	1	1	3	3	0	1	1	1	0	10	.	rockingham	6	1	2	1	3
1	154	3.0	3.0	2.0	4.0	4.0	4.0	1	1	3	3	0	1	0	1	1	10	.	shenandoah	2	1	5	4	5
1	161	3.0	4.0	3.0	4.0	4.0	3.0	1	1	0	0	0	1	0	1	1	75	.	albemarle	2	1	3	7	6
1	166	4.0	.	2.0	2.5	2.5	3.0	1	1	1	0	0	0	0	0	0	0	1	albemarle	7	2	4	3	3
1	167	3.0	3.0	4.0	4.0	3.0	2.5	0	1	1	0	0	0	0	0	1	50	.	nelson	3	1	4	4	5
1	168	3.0	3.0	2.0	4.0	4.0	3.0	0	1	1	3	0	0	0	0	0	5	.	louisa	3	1	2	4	7
1	172	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	1	0	5	.	augusta	4	1	2	4	7
1	174	4.0	4.0	2.0	3.0	3.0	3.0	0	1	2	4	1	1	1	1	0	0	1	amelia	4	1	4	3	10
1	187	4.0	3.0	2.0	3.0	4.0	3.0	0	1	0	0	0	0	0	1	1	10	.	hanover	4	1	3	3	7
1	191	4.0	3.0	2.5	3.0	3.0	4.0	0	1	0	0	0	0	0	0	0	115	.	new kent	3	1	5	4	10
1	214	3.0	3.0	2.5	4.0	4.0	4.0	1	1	2	0	0	0	0	0	0	60	.	richmond	3	2	2	7	10
1	226	3.0	3.0	2.0	2.0	2.0	3.0	0	1	0	0	0	0	0	1	0	0	4	henrico	5	1	2	5	7
1	227	3.0	3.0	3.0	3.0	3.0	3.0	1	1	1	0	0	1	0	1	0	10	.	richmond	6	1	3	7	10
1	230	3.0	3.0	2.0	3.0	2.0	3.0	1	0	2	0	0	0	0	0	1	25	.	richmond	2	1	2	7	8
1	233	4.0	2.5	2.0	4.0	4.0	4.0	0	0	0	1	0	0	0	0	0	25	.	henrico	1	1	2	5	7
1	239	4.0	4.0	3.0	4.0	4.0	4.0	1	1	1	0	1	1	0	1	0	25	.	chesterfield	3	2	2	5	7
1	240	3.0	2.5	2.0	2.5	2.5	3.0	1	1	1	0	0	0	0	0	0	25	.	chesterfield	3	1	2	7	10

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
1	241	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	2	0	0	0	1	0	0	2	chesterfield	4	1	4	4	8
1	242	4.0	3.0	2.0	2.5	2.0	4.0	0	1	0	0	0	0	0	0	0	5	.	chesterfield	4	1	4	5	10
1	264	4.0	3.0	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	0	0	5	.	virginia beach	4	1	2	5	10
1	274	3.0	3.0	3.0	3.0	4.0	3.0	1	1	2	0	0	0	0	0	1	0	2	virginia beach	5	1	2	7	8
1	276	3.0	3.0	2.0	3.0	3.0	3.0	1	1	3	2	0	1	0	0	0	0	2	virginia beach	2	2	4	4	5
1	282	4.0	3.0	2.0	4.0	3.0	3.0	0	0	0	0	0	0	0	0	0	5	.	virginia beach	3	1	3	7	10
1	308	3.0	2.5	3.0	4.0	4.0	3.0	1	0	0	3	0	0	0	0	0	0	2	norfolk	2	1	4	4	3
1	316	3.0	3.0	2.0	4.0	4.0	4.0	1	1	0	0	0	1	0	1	1	10	.	newport news	5	1	1	5	4
1	331	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	0	3	hampton	6	1	3	3	6
1	333	4.0	3.0	1.0	4.0	4.0	3.0	1	1	2	4	0	0	1	1	0	0	2	hampton	3	1	5	4	6
1	335	2.5	2.5	2.0	3.0	3.0	4.0	0	1	0	0	0	0	0	0	0	5	.	hampton	2	1	2	5	6
1	336	3.0	2.5	2.0	3.0	3.0	3.0	0	0	1	3	0	1	0	1	0	0	2	york	3	1	1	4	4
1	345	3.0	3.0	2.0	3.0	3.0	3.0	1	1	2	2	0	0	0	0	0	0	2	portsmouth	3	2	4	5	7
1	347	4.0	2.5	2.0	3.0	2.0	3.0	1	1	0	0	0	0	0	0	0	5	.	portsmouth	3	1	2	4	6
1	355	4.0	3.0	2.0	3.0	3.0	3.0	0	1	3	0	0	.	0	0	0	10	.	petersburg	6	1	2	4	8
1	356	3.0	3.0	3.0	4.0	4.0	3.0	1	1	1	1	0	1	0	1	0	5	.	nottoway	6	1	2	3	2
1	361	4.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	25	.	colonial heights	4	1	2	5	8
1	381	3.0	3.0	2.0	3.0	3.0	2.5	0	0	0	0	0	1	0	1	0	10	.	roanoke	2	1	1	5	3
1	382	4.0	3.0	.	3.0	3.0	4.0	1	1	1	3	0	1	0	1	0	0	2	roanoke	3	1	3	3	4
1	385	3.0	2.5	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	6	roanoke	6	1	2	4	4
1	386	4.0	4.0	1.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	roanoke	7	1	3	4	4
1	397	3.0	3.0	2.0	4.0	4.0	4.0	1	1	2	1	0	0	0	0	0	50	.	montgomery	1	1	2	4	1
1	403	3.0	3.0	2.5	3.0	3.0	3.0	1	1	1	1	0	0	0	1	0	0	4	pulaski	3	1	2	3	3
1	406	3.0	4.0	4.0	4.0	4.0	4.0	1	1	2	3	0	1	0	0	0	0	4		4	1	2	1	3
1	416	4.0	4.0	2.0	3.0	3.0	3.0	1	1	0	0	0	1	0	1	0	0	1	franklin	2	2	3	4	3
1	417	3.0	3.0	2.0	3.0	3.0	3.0	1	0	1	1	0	0	0	0	1	5	.	roanoke	3	1	1	6	4
1	419	4.0	4.0	1.0	1.0	4.0	4.0	0	1	0	0	0	0	1	1	0	0	2	henry	4	1	2	4	10
1	420	3.0	3.0	2.0	4.0	3.0	2.5	1	1	1	3	0	1	0	1	0	25	.	patrick	2	1	2	3	6
1	421	3.0	3.0	2.0	2.0	3.0	3.0	1	1	1	3	0	1	0	1	0	0	2	botetourt	4	1	2	3	4
1	423	3.0	3.0	2.0	3.0	3.0	3.0	1	1	2	0	0	1	0	1	0	0	1	franklin	6	1	2	6	3
1	424	4.0	4.0	3.0	4.0	4.0	3.0	0	1	2	0	0	1	0	1	0	25	.	washington	4	1	2	4	7
1	425	3.0	3.0	2.5	2.5	2.5	3.0	0	1	0	1	0	0	0	1	0	0	2	washington	3	2	4	4	3
1	429	3.0	3.0	2.5	2.5	2.5	3.0	1	1	0	2	0	0	0	1	0	0	4	russell	3	1	3	1	3
1	433	4.0	3.0	2.0	4.0	4.0	4.0	1	1	3	3	0	1	0	1	0	25	.	lee	3	1	4	6	7
1	436	3.0	.	2.0	2.0	.	3.0	0	0	0	0	0	0	0	1	0	1	.	lee	7	2	1	5	1
1	437	3.0	3.0	2.0	3.0	3.0	2.5	0	1	0	0	1	1	1	1	0	0	4	russell	5	1	3	4	4
1	439	3.0	3.0	2.0	2.0	2.0	3.0	0	1	0	0	0	0	0	0	0	0	2	wise	2	1	2	3	5
1	440	4.0	4.0	1.0	3.0	4.0	4.0	0	0	1	0	1	1	1	1	0	5	.	russell	5	1	2	3	5
1	441	3.0	4.0	2.0	4.0	3.0	4.0	1	1	5	3	0	0	0	0	0	100	.	wise	2	1	4	5	7
1	444	4.0	3.0	1.0	4.0	4.0	4.0	1	1	5	2	0	1	0	1	1	100	.	pulaski	2	1	4	3	5
1	446	4.0	3.0	3.0	4.0	4.0	3.0	1	0	2	4	1	1	1	1	0	5	.	washington	2	1	4	4	5
1	447	4.0	3.0	2.0	4.0	4.0	3.0	1	1	1	4	0	1	1	1	0	0	2	carroll	2	1	4	3	5
1	449	4.0	3.0	2.0	3.0	3.0	4.0	0	1	0	1	0	0	0	0	1	50	.	smyth	2	1	4	7	8
1	450	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	.	1	1	1	0	0	4	washington	6	1	2	3	3
1	455	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	augusta	3	1	5	4	6
1	456	4.0	2.5	2.0	3.0	3.0	2.5	0	1	0	0	0	1	0	0	1	1	.	augusta	7	1	2	4	.
1	461	4.0	2.5	2.5	4.0	4.0	3.0	0	0	1	0	0	0	0	0	1	0	5	rockbridge	6	2	.	4	.
1	462	3.0	4.0	2.0	3.0	3.0	2.5	1	0	2	2	0	1	0	1	1	25	.	highland	2	1	1	5	4
1	468	4.0	4.0	2.0	3.0	3.0	3.0	1	1	2	0	0	1	0	1	0	0	2	lynchburg	6	2	1	3	4
1	469	4.0	4.0	2.0	2.0	2.0	3.0	0	0	1	0	0	0	0	0	0	0	2	campbell	4	1	3	3	5
1	470	.	4.0	1.0	.	.	.	1	1	2	2	0	0	0	1	1	0	6	bedford	2	1	5	5	6
1	473	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	1	1	1	1	0	5	.	halifax	5	1	2	3	5

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
1	478	3.0	4.0	1.0	1.0	1.0	4.0	1	1	1	3	0	1	0	1	1	5	.	pittsylvania	5	1	3	3	6
1	479	3.0	3.0	2.0	3.0	3.0	3.0	0	0	1	3	0	0	0	0	0	0	2	pittsylvania	2	1	4	4	7
1	486	3.0	3.0	3.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	1	5	.	bedford	3	1	5	5	7
1	490	3.0	3.0	2.0	3.0	3.0	3.0	0	1	2	5	1	1	1	1	0	5	.	halifax	5	1	2	7	7
1	1006	4.0	4.0	3.0	4.0	4.0	3.0	0	1	3	0	0	0	0	0	1	50	.	fairfax	3	2	6	4	7
1	1019	2.5	2.5	2.5	3.0	2.5	3.0	0	1	0	0	0	0	0	0	0	50	.	fairfax	7	1	3	7	9
1	1024	3.0	3.0	4.0	4.0	4.0	3.0	0	1	0	2	0	0	0	0	0	10	.	fairfax	4	1	4	3	5
1	1026	3.0	3.0	2.0	4.0	3.0	3.0	0	1	2	1	0	0	0	0	0	20	.	fairfax	2	1	3	3	9
1	1027	3.0	4.0	4.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	1	15	.	fairfax	2	2	4	4	9
1	1029	3.0	3.0	2.5	3.0	3.0	4.0	1	1	0	1	0	0	0	0	0	50	.	fairfax	2	1	4	3	9
1	1044	3.0	3.0	2.0	4.0	3.0	3.0	0	1	0	0	0	0	0	0	0	1	.	fairfax	2	1	1	5	6
1	1046	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	1	0	10	.	prince william	4	1	2	3	7
1	1047	4.0	2.5	2.0	2.5	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	prince william	5	2	1	4	1
1	1051	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	2	0	0	0	0	0	50	.	loudoun	3	1	2	4	6
1	1052	2.5	3.0	1.0	3.0	3.0	3.0	1	1	0	1	0	0	0	0	0	1	.	fairfax	2	1	4	4	7
1	1056	4.0	2.5	2.0	3.0	3.0	3.0	0	1	0	1	0	0	0	0	0	0	4	stafford	4	1	3	4	10
1	1058	3.0	3.0	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	1	0	0	3	fairfax	2	1	3	5	6
1	1069	2.5	2.5	2.5	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	5	loudoun	3	2	3	3	.
1	1074	3.0	3.0	2.0	3.0	3.0	4.0	1	1	2	4	0	0	0	0	0	20	.	prince william	3	1	2	3	9
1	1083	2.5	2.5	2.5	2.5	2.5	3.0	1	0	0	0	0	0	0	0	0	10	.	arlington	3	2	4	4	9
1	1085	3.0	3.0	2.0	3.0	3.0	3.0	0	1	2	0	0	0	0	1	0	0	5	arlington	6	1	2	6	7
1	1087	3.0	3.0	3.0	3.0	3.0	3.0	.	0	0	0	0	0	0	0	0	20	.	prince william	2	2	2	6	9
1	1092	3.0	2.5	3.0	4.0	4.0	3.0	0	0	0	0	0	0	0	0	0	25	.	arlington	2	2	2	6	6
1	1094	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	5	.	fairfax	2	2	2	4	3
1	1095	4.0	3.0	3.0	4.0	4.0	4.0	1	0	0	0	0	0	0	0	.	15	.	fairfax	2	2	2	4	6
1	1105	2.5	3.0	3.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	5	.	fairfax	3	2	4	6	10
1	1106	3.0	2.5	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	20	.	fairfax	4	1	4	6	10
1	1112	4.0	3.0	2.0	3.0	4.0	3.0	1	1	1	0	0	0	0	0	0	2	.	fairfax	3	1	4	5	8
1	1113	4.0	3.0	2.0	4.0	4.0	3.0	1	1	5	0	0	0	0	1	1	25	.	fairfax	7	1	2	6	9
1	1115	2.5	3.0	3.0	4.0	4.0	3.0	0	0	1	0	0	0	0	0	0	10	.	fairfax	3	2	3	7	5
1	1117	3.0	2.5	2.0	3.0	3.0	3.0	0	0	3	0	0	0	0	0	1	2	.	fairfax	2	1	1	7	2
1	1121	4.0	3.0	.	4.0	4.0	4.0	1	1	0	0	0	1	0	1	0	0	5	spotsylvania	6	2	3	3	6
1	1132	4.0	3.0	3.0	3.0	3.0	3.0	1	1	1	2	0	0	0	1	1	0	4	stafford	4	1	4	4	8
1	1135	3.0	3.0	.	.	.	.	0	0	0	0	0	0	0	0	0	0	2	frederick	7	2	1	3	2
1	1142	4.0	4.0	2.0	3.0	4.0	3.0	1	1	2	3	0	0	0	0	1	0	4	clarke	3	1	4	6	8
1	1146	4.0	4.0	2.0	2.0	2.0	4.0	1	1	0	2	0	0	0	0	0	25	.	fauquier	2	1	2	2	6
1	1152	4.0	3.0	2.0	4.0	4.0	4.0	1	1	2	0	0	0	0	0	0	100	.	shenandoah	5	1	2	7	10
1	1156	3.0	3.0	3.0	3.0	3.0	3.0	1	1	1	1	0	0	0	0	0	0	2	rockingham	3	1	2	4	7
1	1165	4.0	2.5	2.0	3.0	3.0	3.0	1	1	0	0	0	1	0	0	0	115	.	augusta	4	1	3	6	7
1	1173	4.0	3.0	2.0	2.0	2.0	3.0	1	1	3	0	0	0	0	0	0	0	2	augusta	6	1	2	1	1
1	1179	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	1	0	15	.	richmond	.	.	2	4	4
1	1180	3.0	3.0	3.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	50	.	gloucester	2	1	3	3	4
1	1181	3.0	4.0	1.0	2.5	2.5	3.0	0	1	0	0	1	0	1	0	0	0	2	gouchland	6	1	2	3	.
1	1183	4.0	4.0	1.0	2.0	2.0	4.0	0	1	1	2	0	0	0	0	0	0	1	henrico	5	1	3	1	6
1	1184	4.0	4.0	1.0	3.0	.	4.0	0	1	0	0	0	0	0	0	0	0	2	louisa	6	2	2	1	1
1	1188	4.0	4.0	1.0	3.0	3.0	3.0	0	1	0	5	0	0	0	0	0	50	.	chesterfield	3	1	3	4	9
1	1189	3.0	2.5	2.0	4.0	4.0	4.0	1	1	2	1	0	0	0	0	0	25	.	chesterfield	2	1	3	5	9
1	1198	3.0	4.0	2.0	4.0	4.0	4.0	0	1	0	0	0	0	0	1	0	55	.	williamsburg	2	1	1	5	4
1	1201	4.0	4.0	2.0	4.0	4.0	4.0	0	1	2	2	1	0	1	0	0	5	.	chesterfield	3	1	4	4	9
1	1203	3.0	3.0	2.0	2.5	2.5	.	0	0	2	0	0	0	0	1	1	5	.	richmond	7	1	1	5	8
1	1204	4.0	4.0	3.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	0	5	.	richmond	6	2	4	4	.
1	1208	4.0	4.0	2.0	2.0	2.0	4.0	0	1	2	0	1	1	0	0	0	0	1	henrico	6	1	2	3	3

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
1	1223	3.0	3.0	.	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	2	richmond	2	2	2	6	.
1	1224	3.0	4.0	3.0	4.0	4.0	3.0	0	1	0	0	0	0	0	1	0	10	.	richmond	1	2	3	3	3
1	1229	4.0	3.0	1.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	0	2	henrico	6	1	2	4	6
1	1231	4.0	4.0	2.0	.	3.0	3.0	1	1	0	0	0	1	0	0	0	0	2	henrico	5	2	1	4	4
1	1235	3.0	3.0	2.0	3.0	3.0	3.0	1	0	0	0	0	0	0	0	0	10	.	henrico	2	1	2	5	9
1	1247	4.0	4.0	2.0	3.0	3.0	3.0	1	1	0	1	0	0	0	0	0	20	.	chesapeake	2	2	6	3	5
1	1255	4.0	4.0	2.5	2.5	2.5	4.0	1	1	2	5	0	1	0	0	0	25	.	chesapeake	1	1	3	3	4
1	1262	4.0	3.0	2.0	4.0	3.0	4.0	1	1	3	3	0	1	0	1	0	25	.	suffolk	2	1	3	3	7
1	1263	4.0	3.0	3.0	4.0	4.0	4.0	1	1	1	0	1	1	0	1	0	25	.	suffolk	4	1	2	3	7
1	1269	4.0	4.0	2.0	4.0	4.0	4.0	1	0	2	0	0	1	0	0	0	0	8	fairfax	7	2	1	3	2
1	1270	2.5	2.5	2.0	2.5	2.5	3.0	0	0	0	0	0	0	0	0	0	0	4	virginia beach	1	1	2	4	5
1	1271	3.0	2.5	3.0	4.0	4.0	3.0	1	0	1	0	0	0	0	0	1	0	11	virginia beach	5	1	2	4	.
1	1277	3.0	4.0	2.0	4.0	4.0	4.0	1	1	1	0	0	0	0	1	1	25	.	virginia beach	2	1	1	5	6
1	1280	4.0	3.0	.	4.0	4.0	4.0	0	0	0	0	1	0	1	0	0	0	2	virginia beach	6	1	2	1	2
1	1284	4.0	3.0	2.0	4.0	4.0	4.0	1	0	2	2	0	0	0	1	1	50	.	virginia beach	3	1	4	4	6
1	1290	4.0	3.0	2.0	4.0	4.0	3.0	1	1	2	4	0	1	0	1	0	0	3	virginia beach	5	1	2	4	7
1	1292	3.0	2.5	2.0	2.0	2.0	3.0	1	1	0	0	0	0	0	0	0	10	.	virginia beach	2	1	4	5	6
1	1293	4.0	3.0	2.0	2.0	2.0	3.0	1	1	0	0	0	1	0	1	0	25	.	norfolk	6	1	3	4	6
1	1295	4.0	4.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	5	.	virginia beach	2	1	2	4	6
1	1305	4.0	4.0	1.0	2.5	3.0	2.5	0	0	0	0	0	0	0	0	0	0	3	norfolk	6	1	2	2	3
1	1306	4.0	4.0	3.0	4.0	4.0	4.0	0	1	3	0	0	0	0	0	1	100	.	norfolk	5	1	2	7	9
1	1311	4.0	2.5	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	4	norfolk	5	1	2	3	3
1	1313	4.0	4.0	1.0	2.0	3.0	3.0	1	1	0	0	0	0	0	1	0	0	2	norfolk	5	2	1	3	1
1	1314	3.0	3.0	2.0	4.0	4.0	3.0	1	1	7	2	0	0	0	0	0	0	10	newport news	4	1	3	4	.
1	1315	4.0	4.0	2.0	3.0	3.0	3.0	1	1	1	2	0	0	0	0	0	5	.	new kent	2	2	4	3	3
1	1332	4.0	4.0	1.0	1.0	1.0	4.0	0	1	0	0	0	0	0	0	0	0	2	hampton	4	1	3	4	10
1	1334	4	2.5	3.0	1.0	1.0	3.0	0	0	0	0	0	0	0	0	0	0	2	hampton	3	1	3	7	7
1	1340	3	4.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	5	.	york	6	1	3	3	6
1	1348	4	4.0	2.0	3.0	3.0	3.0	1	1	1	0	0	1	0	0	1	10	.	portsmouth	3	1	3	3	6
1	1354	4	4.0	2.0	2.0	3.0	4.0	1	1	0	2	0	0	0	0	0	10	.	prince geroge	3	1	4	4	8
1	1357	4	3.0	2.0	3.0	3.0	3.0	1	1	3	1	0	1	0	1	0	10	.	chesterfield	2	1	1	4	6
1	1367	3	3.0	2.5	4.0	4.0	3.0	0	0	1	2	0	0	0	1	0	0	2	chesterfield	2	2	2	5	8
1	1369	4	3.0	2.0	2.5	2.5	3.0	0	1	0	0	0	0	0	1	0	10	.	brunswick	6	1	2	4	9
1	1370	3	3.0	3.0	3.0	3.0	3.0	0	1	0	1	0	0	0	0	0	0	2	prince george	6	1	2	1	1
1	1374	3	3.0	3.0	4.0	4.0	3.0	0	1	0	0	0	1	0	1	0	25	.	mecklenburg	3	2	3	.	2
1	1375	4	3.0	.	.	.	3.0	0	0	0	0	0	0	0	0	0	0	2	mecklenburg	6	2	3	3	.
1	1376	.	4.0	2.0	2.5	2.5	3.0	0	1	1	1	0	0	1	0	1	10	.	buchingham	6	2	3	2	1
1	1377	4	3.0	2.5	3.0	3.0	4.0	1	1	0	3	0	0	0	1	0	0	1	charlotte	2	1	5	3	7
1	1380	4	3.0	2.0	2.0	3.0	4.0	1	1	2	2	0	0	0	0	0	5	.		7	1	2	1	2
1	1384	3	4.0	3.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	2	roanoke	5	1	3	2	.
1	1388	4	3.0	2.0	3.0	4.0	3.0	0	0	0	1	0	0	0	0	0	0	2	roanoke	5	1	3	4	3
1	1389	4	3.0	1.0	2.0	4.0	3.0	1	1	1	0	0	1	0	1	0	5	.	roanoke	3	1	3	6	.
1	1395	3	3.0	2.0	3.0	3.0	2.5	0	1	2	3	0	0	0	1	0	10	.	henry	4	1	3	3	6
1	1396	4	3.0	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	1	0	0	2	montgomery	4	1	3	3	8
1	1402	4	3.0	2.5	3.0	3.0	3.0	1	1	0	3	0	0	.	.	.	0	5	henry	2	1	2	3	7
1	1404	3	4.0	2.0	2.0	3.0	4.0	1	1	0	2	0	1	0	1	0	0	10	franklin	4	1	3	2	6
1	1405	.	4.0	4.0	2.0	.	.	1	1	0	0	.	1	1	1	0	0	1	floyd	7	2	2	7	1
1	1414	3	2.5	2.0	3.0	3.0	3.0	0	1	2	0	0	0	0	0	0	0	2	henry	3	1	4	4	10
1	1415	3	4.0	2.0	3.0	2.0	3.0	1	1	4	3	0	0	1	0	0	1	.	franklin	3	1	5	2	4
1	1422	4	4.0	2.0	4.0	4.0	3.0	1	1	2	0	0	1	0	1	0	5	.	roanoke	3	1	1	1	1
1	1427	3	3.0	2.5	2.5	3.0	3.0	0	1	0	1	0	1	0	1	0	0	4	washington	3	1	4	2	3
1	1428	3	3.0	3.0	3.0	2.5	3.0	1	0	2	3	0	0	0	0	0	0	4	dickenson	3	1	1	2	.

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
1	1431	4	3.0	2.0	2.5	2.0	3.0	0	1	0	1	0	0	0	0	0	0	2	wise	5	1	3	2	2
1	1445	4	4.0	1.0	2.5	2.5	2.5	1	1	1	3	0	1	0	1	1	1	.	grayson	4	1	2	2	.
1	1448	4	4.0	1.0	3.0	3.0	4.0	0	1	0	2	0	0	0	1	0	20	.	grayson	2	1	4	2	6
1	1453	3	3.0	4.0	4.0	4.0	4.0	1	1	2	1	0	1	0	1	0	0	2	wythe	2	2	1	4	1
1	1457	4	2.5	2.5	2.5	4.0	4.0	0	1	0	0	0	0	0	0	1	0	4	rockbridge	4	2	2	3	7
1	1459	3	3.0	2.0	3.0	3.0	3.0	0	0	0	2	0	0	0	0	0	5	.	chesterfield	2	1	1	6	6
1	1465	4	4.0	3.0	4.0	4.0	4.0	1	1	0	0	0	1	0	1	0	0	2	lynchburg	4	2	1	4	3
1	1466	4	4.0	2.0	3.0	3.0	3.0	0	1	0	0	1	1	1	1	1	10	.	lynchburg	3	1	1	6	8
1	1467	3	3.0	1.0	3.0	3.0	2.5	0	1	0	0	0	0	0	0	0	0	4	lynchburg	4	1	5	5	5
1	1471	4	4.0	1.0	2.0	2.0	2.5	0	1	0	1	0	1	0	1	1	25	.	pittsylvania	2	2	1	5	3
1	1477	3	3.0	2.5	3.0	3.0	3.0	0	1	0	0	0	0	0	1	0	0	4	pittsylvania	4	1	2	4	3
1	1480	4	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	pittsylvania	7	1	2	3	2
1	1481	.	.	.	.	.	.	0	0	0	0	0	0	0	0	0	0	2	pittsylvania	6	1	2	1	2
1	1485	4	4.0	2.0	4.0	4.0	4.0	1	1	3	0	0	0	0	0	0	5	.	bedford	3	2	3	5	8
1	1496	3	4.0	2.0	2.0	2.0	4.0	1	1	3	4	0	0	0	1	0	10	.	buchanan	4	1	3	3	7
1	1498	3	4.0	.	2.5	2.5	2.5	1	1	0	1	0	0	0	0	0	0	2	buchanan	5	1	3	1	2
1	2045	4	3.0	2.0	3.0	2.0	3.0	1	1	0	0	0	0	0	0	1	0	3	fairfax	2	1	2	7	10
1	2054	4	3.0	2.0	3.0	3.0	3.0	1	1	2	1	0	0	0	0	0	10	.	fairfax	5	2	3	4	10
1	2073	3	3.0	2.0	3.0	4.0	4.0	1	1	1	1	0	0	0	0	0	5	.	prince william	4	1	5	4	10
1	2084	3	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	1	20	.	arlington	2	2	2	6	9
1	2099	4	4.0	2.0	2.0	3.0	3.0	1	1	2	0	0	0	0	0	0	0	2	fairfax	2	2	2	5	8
1	2119	3	4.0	2.0	4.0	4.0	3.0	0	1	1	1	0	0	0	1	0	5	.	franklin	2	1	2	4	6
1	2133	4	4.0	2.5	1.0	3.0	4.0	0	1	0	0	0	0	0	0	0	0	1	essex	6	1	.	3	1
1	2144	3	3.0	3.0	2.0	1.0	3.0	0	1	1	0	0	0	1	1	0	20	.	shenandoah	7	1	2	5	3
1	2169	4	3.0	2.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	10	.	orange	3	1	4	7	7
1	2190	4	3.0	2.0	4.0	3.0	4.0	1	1	1	0	0	0	0	0	0	10	.	chesterfield	3	1	4	3	5
1	2236	3.0	2.5	2.0	4.0	4.0	4.0	0	1	1	2	0	1	0	1	0	25	.	chesterfield	3	1	5	4	.
1	2249	4.0	4.0	3.0	3.0	3.0	4.0	1	1	1	0	0	0	0	0	0	0	2	chesapeake	5	2	2	3	.
1	2258	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	1	0	1	0	20	.	accomack	2	1	3	3	3
1	2275	4.0	3.0	2.0	3.0	3.0	2.5	0	1	1	0	0	0	0	0	0	0	2	hampton	3	2	4	5	4
1	2286	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	virginia beach	5	1	5	1	9
1	2287	3.0	3.0	1.0	3.0	3.0	4.0	0	0	0	0	0	0	0	0	0	0	2	virginia beach	4	1	3	6	9
1	2363	3.0	4.0	2.0	4.0	4.0	4.0	0	1	0	2	0	1	0	1	0	5	.	greensville	2	1	4	5	8
1	2373	4.0	3.0	2.0	2.5	2.5	3.0	1	1	0	3	0	0	0	0	0	0	2	brunswick	6	1	1	.	1
1	2409	3.0	4.0	1.0	2.0	2.0	3.0	0	1	1	3	0	0	1	1	0	0	2	henry	3	1	4	4	6
1	2426	4.0	4.0	3.0	3.0	3.0	4.0	0	0	0	0	0	0	0	0	0	0	4	bristol	7	2	2	1	1
1	2432	4.0	3.0	3.0	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	2	lee	5	2	3	1	1
1	2438	3.0	3.0	2.0	2.5	2.5	3.0	0	1	1	0	0	0	0	0	0	0	2	wise	5	1	3	2	2
1	2443	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	2	0	0	0	0	0	0	2	carroll	6	1	2	2	1
1	2460	4.0	4.0	2.0	3.0	3.0	3.0	1	1	3	1	0	1	0	0	0	5	.	augusta	3	1	3	3	6
1	2488	4.0	4.0	1.0	4.0	4.0	4.0	0	1	0	2	0	0	1	0	0	0	1	campbell	2	1	4	3	3
1	2493	4.0	4.0	2.0	1.0	1.0	4.0	1	0	0	2	0	1	0	.	0	5	.	halifax	6	1	2	1	.
1	2495	4.0	4.0	2.0	2.0	2.5	2.5	0	0	0	3	0	1	0	1	0	0	1	tazewell	4	1	3	3	8
1	3012	.	3.0	.	.	.	.	0	1	1	0	0	0	0	.	0	0	5	fairfax	5	1	1	1	1
1	3031	4.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	1	0	25	.	fairfax	7	1	2	6	7
1	3299	4.0	3.0	3.0	3.0	4.0	3.0	1	0	3	0	0	0	0	0	0	0	3	norfolk	3	1	4	6	10
1	3407	3.0	3.0	3.0	3.0	3.0	2.5	1	1	1	3	0	0	0	0	0	0	2	henry	2	1	3	2	6
1	4268	3.0	.	2.0	3.0	.	3.0	0	0	.	0	0	0	0	0	0	0	2		3	2	2	3	6
2	3	4.0	4.0	4.0	4.0	4.0	4.0	1	1	1	0	0	1	0	1	0	100	.	fairfax	6	1	2	6	7
2	8	3.0	2.5	2.0	3.0	3.0	3.0	0	1	0	4	0	0	0	0	0	10	.	fairfax	3	1	5	7	10
2	12	3.0	3.0	3.0	4.0	4.0	3.0	1	1	2	0	0	0	0	1	1	10	.	prince william	3	1	4	7	8
2	13	3.0	3.0	2.0	4.0	4.0	3.0	0	1	3	1	0	0	0	0	1	100	.	fairfax	.	.	.	.	.

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
2	17	3.0	3.0	2.0	4.0	4.0	3.0	0	1	1	0	0	0	0	0	1	25	.	fairfax	5	1	7	7	10
2	20	4.0	3.0	2.0	2.0	3.0	.	1	0	0	0	0	0	0	0	0	10	.	fcirfax	5	1	2	5	7
2	23	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	1	0	15	.	fairfax	2	2	2	7	10
2	26	4.0	3.0	2.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	1	5	.	fairfax	5	1	3	6	9
2	29	2.5	3.0	2.5	4.0	4.0	3.0	0	1	1	0	0	0	0	0	0	25	.	fairfax	4	1	3	5	10
2	32	2.5	2.5	2.0	4.0	4.0	3.0	0	1	1	0	0	0	0	1	0	0	2	fairfax	3	2	4	4	8
2	41	2.5	2.5	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	0	2	fairfax	4	1	2	7	10
2	42	3.0	3.0	2.0	2.0	2.0	3.0	0	1	0	0	0	0	0	0	.	0	2	fairfax	5	1	5	5	9
2	43	3.0	3.0	4.0	4.0	4.0	3.0	1	1	3	0	0	0	0	1	0	25	.	fairfax	4	1	2	7	9
2	49	3.0	4.0	3.0	3.0	3.0	3.0	1	1	0	3	0	0	0	0	0	0	2	fairfax	3	1	4	1	6
2	50	3.0	3.0	2.0	3.0	3.0	4.0	1	1	3	4	0	1	0	1	0	100	.	prince william	3	1	2	4	10
2	53	4.0	3.0	2.0	4.0	3.0	4.0	1	1	3	4	0	1	0	1	0	10	.	loudoun	2	1	5	4	6
2	55	3.0	3.0	3.0	4.0	4.0	3.0	1	1	0	0	0	0	0	1	0	10	.	fairfax	4	2	2	5	5
2	56	4.0	3.0	2.0	3.0	3.0	3.0	1	0	0	0	0	1	0	1	0	100	.	fairfax	3	1	4	5	6
2	57	4.0	3.0	1.0	2.0	2.0	3.0	0	0	0	0	0	0	0	0	1	5	.	fairfax	4	1	4	6	8
2	58	4.0	3.0	3.0	4.0	4.0	4.0	1	1	3	0	0	0	0	0	0	50	.	fairfax	2	1	2	5	9
2	65	3.0	2.5	3.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	1	100	.	loudoun	3	1	4	6	10
2	68	4.0	3.0	2.0	4.0	4.0	3.0	1	1	1	1	0	1	0	1	1	50	.	fauquier	6	1	2	7	7
2	70	4.0	4.0	3.0	4.0	4.0	4.0	1	1	1	2	0	0	0	1	0	50	.	prince william	4	1	5	4	10
2	74	3.0	3.0	2.0	4.0	4.0	3.0	0	1	0	0	0	0	0	0	0	0	2	prince william	4	1	4	4	10
2	76	4.0	4.0	4.0	4.0	4.0	3.0	0	0	3	0	0	1	0	0	0	5	.	arlington	2	1	4	4	6
2	84	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	5	.	arlington	3	2	2	5	9
2	85	4.0	3.0	2.0	2.5	2.5	2.5	0	0	0	0	0	1	0	0	0	0	2	arlington	7	1	2	4	6
2	90	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	1	0	0	0	0	0	0	1	arlington	6	1	3	7	10
2	96	4.0	3.0	3.0	4.0	4.0	4.0	1	1	4	3	0	0	0	0	1	25	.	fairfax	3	2	6	4	7
2	105	4.0	3.0	3.0	4.0	4.0	4.0	1	1	0	1	0	0	0	1	0	0	4	fairfax	4	2	1	5	5
2	106	3.0	2.5	2.0	2.0	2.0	3.0	0	1	0	2	0	0	0	0	0	0	1	fairfax	5	1	3	5	10
2	107	3.0	2.5	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	0	1	80	.	fairfax	3	1	5	7	7
2	108	4.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	1	1	5	.	fairfax	4	1	2	7	10
2	117	3.0	2.5	2.0	2.5	2.0	4.0	0	1	0	0	0	0	0	0	0	0	3	fairfax	2	1	2	6	6
2	126	.	4.0	.	3.0	3.0	3.0	0	1	0	0	1	1	0	0	0	0	4	northumberland	5	1	2	2	.
2	127	3.0	3.0	2.0	4.0	4.0	4.0	1	.	2	6	0	0	0	0	1	0	5	king george	3	1	2	4	7
2	131	4.0	3.0	3.0	4.0	3.0	3.0	0	0	0	1	0	0	0	0	0	0	2	stafford	2	1	4	4	7
2	134	3.0	3.0	4.0	4.0	4.0	4.0	1	0	1	0	0	1	0	0	0	55	.	northumberland	2	2	1	6	3
2	137	4.0	3.0	2.0	4.0	4.0	3.0	1	1	1	0	0	1	0	1	.	0	4	frederick	3	2	2	6	2
2	142	4.0	3.0	3.0	3.0	3.0	3.0	1	1	5	3	0	1	0	1	0	10	.	page	2	2	3	4	4
2	146	4.0	3.0	2.0	3.0	3.0	4.0	1	1	6	4	0	.	0	1	0	0	2	fauquier	7	1	1	2	1
2	150	4.0	3.0	2.0	3.0	4.0	3.0	1	1	2	1	0	0	0	1	0	50	.	rockingham	5	1	2	4	7
2	156	4.0	4.0	2.0	3.0	4.0	3.0	0	1	0	0	0	1	1	1	0	50	.	shenandoah	5	1	2	3	6
2	158	4.0	2.5	1.0	3.0	4.0	4.0	0	1	0	0	0	1	0	1	0	0	4	rockingham	5	1	2	1	3
2	167	4.0	2.5	2.0	4.0	4.0	3.0	0	1	0	1	0	1	0	1	0	0	2	augusta	5	1	3	3	7
2	168	4.0	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	1	10	.	albemarle	3	1	4	4	6
2	169	3.0	3.0	3.0	4.0	4.0	4.0	1	1	1	3	0	1	0	1	0	50	.	orange	3	1	7	4	6
2	171	4.0	3.0	2.5	3.0	3.0	.	0	0	0	0	0	.	0	.	.	0	5		.	.	.	.	.
2	173	3.0	3.0	2.0	4.0	4.0	4.0	1	1	1	1	0	0	0	0	1	5	.	augusta	2	2	2	4	4
2	174	4.0	4.0	2.0	3.0	3.0	3.0	0	0	3	3	0	1	0	1	0	5	.	amelia	2	1	3	3	7
2	175	4.0	4.0	3.0	4.0	4.0	4.0	1	1	3	0	0	0	0	.	0	25	.	hanover	5	2	2	6	8
2	178	4.0	4.0	2.0	4.0	4.0	3.0	1	1	2	0	0	0	0	0	1	25	.	henrico	6	2	2	6	6
2	182	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	1	0	1	0	1	0	5	.	gloucester	6	1	2	3	2
2	192	4.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	.	1	0	1	1	5	.	powhatan	6	1	2	3	5
2	193	3.0	3.0	2.5	3.0	3.0	2.5	0	1	0	0	0	0	0	0	0	25	.	mathews	6	2	1	4	2
2	194	2.5	3.0	2.5	2.5	2.5	3.0	0	0	0	0	0	0	0	0	0	0	2	henrico	5	2	1	3	3

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
2	197	4.0	3.0	2.0	3.0	3.0	4.0	0	1	1	1	0	0	.	.	.	.	.	james city	7	1	1	1	3
2	200	2.5	3.0	2.0	4.0	4.0	4.0	1	0	1	1	0	0	0	0	0	115	.	richmond	1	1	3	5	7
2	207	4.0	4.0	1.0	.	.	4.0	1	1	1	3	0	0	0	0	0	0	2	richmond	5	1	2	2	4
2	211	.	3.0	2.0	2.0	2.0	3.0	0	1	1	0	0	0	0	0	0	0	3	ricmondc	4	2	2	2	1
2	214	3.0	3.0	2.0	4.0	3.0	.	1	1	3	1	0	0	0	0	1	25	.	richmond	3	1	1	7	6
2	227	2.5	4.0	4.0	4.0	4.0	4.0	0	1	0	0	0	0	0	1	1	100	.	richmond	3	2	5	6	6
2	236	4.0	4.0	2.0	4.0	3.0	3.0	1	0	0	3	0	1	0	1	0	0	2	chesterfield	3	1	4	7	6
2	238	4.0	3.0	2.5	3.0	4.0	3.0	1	1	1	1	0	0	0	0	0	45	.	chesterfield	6	1	2	4	.
2	242	3.0	4.0	2.0	4.0	4.0	3.0	1	1	1	0	0	1	0	1	1	5	.	chesterfield	3	2	5	4	6
2	246	4.0	4.0	2.0	3.0	4.0	4.0	0	1	0	0	0	0	0	1	1	5	.	chesapeake	3	1	4	4	2
2	250	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	2	0	0	0	0	0	0	2	chesapeake	6	1	2	3	4
2	257	3.0	3.0	3.0	4.0	4.0	3.0	1	1	2	0	0	0	0	1	0	0	8	accomack	6	2	2	6	3
2	265	4.0	4.0	4.0	4.0	4.0	3.0	1	0	1	0	0	1	0	0	1	100	.	virginia beach	4	2	1	6	6
2	267	4.0	3.0	2.0	4.0	4.0	3.0	1	0	1	0	0	0	0	0	0	5	.	virginia beach	2	1	3	7	8
2	281	4.0	4.0	2.0	4.0	4.0	3.0	0	0	0	0	0	0	0	0	0	10	.	virginia beach	3	1	2	3	8
2	284	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	4	virginia beach	5	1	2	3	7
2	285	4.0	4.0	2.0	4.0	4.0	4.0	1	1	1	0	0	0	0	1	0	20	.	virginia beach	4	2	1	4	5
2	295	4.0	4.0	2.5	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	5	.	norfolk	5	2	2	4	6
2	296	3.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	5	.	norfolk	4	1	5	3	2
2	302	3.0	3.0	2.0	3.0	3.0	4.0	1	1	2	3	0	0	.	1	1	60	.	norfolk	4	1	3	7	10
2	304	4.0	3.0	2.0	4.0	4.0	4.0	1	1	2	0	0	0	0	0	0	0	4	norfolk	3	2	3	7	8
2	312	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	0	3	norfolk	5	1	2	4	5
2	323	4.0	3.0	1.0	3.0	3.0	3.0	0	0	0	0	0	1	0	1	0	0	2	newport news	4	1	3	5	8
2	336	4.0	4.0	1.0	2.0	1.0	3.0	0	1	4	0	0	1	0	1	0	30	.	hampton	6	1	2	1	1
2	339	3.0	2.5	2.0	2.5	2.5	3.0	1	1	1	0	0	0	0	0	0	5	.	hampton	4	1	4	4	6
2	341	4.0	3.0	2.0	4.0	4.0	3.0	1	0	0	1	0	0	0	0	0	0	2	portsmouth	3	1	4	5	6
2	344	4.0	2.5	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	1	0	0	4	portsmouth	4	1	4	3	8
2	363	4.0	3.0	2.0	4.0	4.0	4.0	1	0	4	4	0	1	0	1	1	0	2	greensville	2	1	3	4	6
2	370	4.0	3.0	2.0	3.0	3.0	4.0	1	1	2	3	0	1	0	1	0	50	.	prince george	1	1	3	4	5
2	372	4.0	4.0	2.0	3.0	3.0	4.0	0	0	0	0	0	1	0	1	0	25	.	prince edward	2	1	5	7	9
2	379	4.0	3.0	2.0	4.0	4.0	4.0	1	1	1	5	0	0	0	1	0	25	.	roanoke	2	1	5	4	6
2	385	4.0	4.0	1.0	3.0	3.0	4.0	0	1	3	1	0	0	0	1	0	25	.	roanoke	6	1	2	4	6
2	395	3.0	3.0	4.0	4.0	4.0	3.0	0	1	5	2	0	1	0	1	1	10	.	henry	3	1	4	4	7
2	398	4.0	3.0	3.0	3.0	4.0	3.0	0	1	1	0	0	0	0	0	0	30	.	montgomery	2	2	3	4	5
2	399	3.0	3.0	3.0	3.0	3.0	3.0	1	1	4	4	0	1	0	1	1	0	4	franklin	4	1	3	3	5
2	402	4.0	3.0	2.0	2.5	2.5	3.0	1	1	0	0	0	1	0	1	0	0	5	botetourt	7	1	2	4	3
2	406	3.0	3.0	2.0	3.0	3.0	4.0	1	1	1	3	0	0	0	1	0	20	.	bedford	5	1	2	4	8
2	407	.	.	.	.	.	.	.	.	.	.	.	.	0	0	0	0	2	.	.	.	.	.	.
2	408	4.0	4.0	2.0	2.0	3.0	3.0	0	1	1	0	0	1	0	1	0	5	.	franklin	4	1	2	3	8
2	414	3.0	3.0	2.0	2.0	2.0	3.0	0	1	0	0	0	1	0	1	0	0	2	henry	4	1	3	2	.
2	420	3.0	3.0	2.0	3.0	3.0	3.0	1	1	3	1	0	0	0	0	0	10	.	patrick	4	1	2	3	5
2	422	4.0	2.5	2.0	4.0	4.0	3.0	0	1	1	0	0	0	0	0	0	50	.	roanoke	3	1	4	5	7
2	423	4.0	4.0	1.0	4.0	4.0	3.0	1	1	0	3	0	1	1	1	0	0	1	washington	4	1	2	1	1
2	429	4.0	3.0	.	3.0	3.0	3.0	0	1	0	0	.	.	1	.	0	0	5	russell	6	1	2	1	2
2	430	4.0	4.0	2.0	2.0	2.0	4.0	0	1	1	0	0	0	0	0	0	0	1	dickenson	2	2	5	2	1
2	436	3.0	3.0	2.0	3.0	3.0	2.5	0	1	1	0	0	1	1	1	0	0	2	lee	4	1	2	4	3
2	439	3.0	4.0	2.0	3.0	3.0	4.0	1	1	1	1	0	0	0	0	0	10	.	wise	2	1	1	5	5
2	441	4.0	3.0	2.0	2.5	2.5	3.0	0	1	2	1	0	0	0	0	0	5	.	pulaski	6	2	2	4	3
2	443	3.0	3.0	2.0	2.5	2.5	3.0	0	1	1	0	0	0	0	1	0	10	.	smyth	5	1	2	1	1
2	444	3.0	4.0	1.0	3.0	3.0	3.0	0	0	1	0	0	1	0	0	0	5	.	grayson	3	1	5	5	10
2	446	2.5	4.0	3.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	0	2	washington	4	2	2	3	5
2	450	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	1	0	0	0	1	0	0	3	grayson	6	1	2	1	2

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
2	462	3.0	2.5	1.0	3.0	3.0	2.5	0	1	1	0	1	1	1	1	0	0	4	augusta	3	1	8	4	6
2	463	4.0	3.0	1.0	3.0	3.0	3.0	1	0	0	0	1	1	1	1	0	0	1	augusta	6	1	2	7	6
2	471	3.0	4.0	2.5	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	lynchburg	1	2	3	5	3
2	474	3.0	4.0	1.0	3.0	4.0	2.5	1	1	1	1	1	1	1	1	0	0	1	appomattox	4	1	2	4	3
2	475	4.0	3.0	2.0	3.0	3.0	3.0	1	0	0	0	0	1	0	1	0	5	.	pittsylvania	3	1	3	5	8
2	485	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	buckingham	5	1	2	2	1
2	492	3.0	3.0	2.0	2.5	2.5	2.5	0	0	1	3	0	1	0	1	0	5	.	halifax	3	1	3	4	6
2	494	4.0	3.0	2.0	2.0	1.0	4.0	0	1	1	3	0	1	0	1	1	0	4	tazewell	6	1	2	1	3
2	498	3.0	3.0	2.0	1.0	1.0	4.0	1	1	6	3	0	0	0	0	0	0	2	tazewell	4	1	2	3	9
2	1002	3.0	2.5	2.5	3.0	3.0	4.0	1	1	0	0	0	0	0	0	0	0	3	fairfax	7	2	1	3	3
2	1007	3.0	3.0	3.0	4.0	4.0	4.0	1	0	0	2	0	0	0	0	0	10	.	fairfax	1	1	1	5	3
2	1009	4.0	4.0	2.0	4.0	4.0	3.0	1	0	2	3	0	0	0	0	0	0	2	fauquier	3	1	4	4	10
2	1011	3.0	3.0	3.0	4.0	4.0	4.0	0	1	2	0	0	0	0	.	0	0	3	fairfax	4	1	4	7	7
2	1015	3.0	3.0	3.0	4.0	4.0	3.0	0	0	0	0	0	0	0	0	0	0	2	fairfax	5	1	1	4	4
2	1018	3.0	2.5	2.0	2.5	2.5	3.0	1	1	1	0	0	0	0	0	0	10	.	fairfax	5	1	3	7	10
2	1019	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	15	.	fairfax	3	1	3	4	8
2	1021	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	10	.	fairfax	3	1	4	7	8
2	1024	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	1	0	0	0	0	2	fairfax	2	1	3	6	7
2	1028	4.0	4.0	.	3.0	3.0	3.0	0	0	1	0	0	0	0	1	0	0	2	fairfax	7	2	2	4	3
2	1030	3.0	3.0	2.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	0	2	.	2	2	4	3	4
2	1031	3.0	3.0	2.0	2.0	4.0	2.5	0	0	0	0	0	0	0	0	0	5	.	fairfax	2	2	6	5	7
2	1036	2.5	2.5	3.0	3.0	3.0	2.5	0	0	0	0	0	0	0	0	0	0	4	loudoun	2	2	1	3	4
2	1038	4.0	3.0	3.0	4.0	4.0	3.0	0	1	1	0	0	0	1	1	0	100	.	fairfax	4	1	2	7	10
2	1048	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	10	prince william	5	2	2	7	9
2	1060	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	fairfax	2	1	4	5	10
2	1061	4.0	3.0	2.0	3.0	3.0	4.0	1	0	1	0	0	0	0	1	1	100	.	loudoun	2	1	1	5	7
2	1066	4.0	.	4.0	4.0	4.0	4.0	1	1	5	2	0	1	0	1	0	0	4	fairfax	2	2	4	4	5
2	1081	4.0	2.5	2.0	4.0	4.0	3.0	0	1	0	1	0	1	0	1	0	10	.	fairfax	2	1	2	7	7
2	1082	3.0	3.0	2.0	3.0	3.0	3.0	1	0	0	0	0	0	0	0	0	0	2	fairfax	2	2	3	7	5
2	1086	3.0	3.0	3.0	4.0	4.0	4.0	1	1	2	0	0	0	0	0	1	50	.	arlington	2	2	2	5	7
2	1091	3.0	3.0	2.0	2.5	2.5	2.5	0	0	0	0	0	0	0	0	0	25	.	arlington	3	2	3	5	10
2	1092	4.0	3.0	2.0	3.0	3.0	4.0	0	0	0	0	0	0	0	0	0	10	.	fairfax	1	1	1	5	4
2	1095	3.0	.	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	fairfax	3	1	1	6	5
2	1099	3.0	3.0	2.0	4.0	4.0	4.0	1	1	3	3	0	1	0	1	1	5	.	isle of wright	4	1	2	7	6
2	1101	3.0	2.5	2.0	3.0	3.0	3.0	1	0	1	0	0	0	0	0	0	25	.	fairfax	2	2	1	7	7
2	1110	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	0	1	0	0	0	0	3	fairfax	1	2	6	7	9
2	1111	3.0	3.0	2.5	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	20	.	fairfax	6	1	2	5	6
2	1114	4.0	2.5	2.0	3.0	4.0	3.0	0	1	0	0	0	0	0	0	0	0	11	fairfax	3	1	2	3	8
2	1115	3.0	2.5	2.0	4.0	4.0	3.0	0	1	1	0	0	1	0	1	1	50	.	fairfax	5	1	2	7	10
2	1122	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	5	.	stafford	2	2	4	3	9
2	1123	3.0	3.0	1.0	3.0	3.0	3.0	0	0	1	2	0	0	0	0	0	0	2	stafford	5	1	2	5	10
2	1124	3.0	3.0	3.0	3.0	2.0	3.0	0	1	0	0	0	1	0	1	0	0	4	essex	4	2	5	3	2
2	1135	3.0	3.0	2.0	3.0	2.5	3.0	0	1	1	0	0	0	0	1	0	0	4	frederick	5	1	2	7	6
2	1138	4.0	3.0	1.0	1.0	2.0	3.0	1	1	1	3	0	1	0	1	0	5	.	clarke	4	1	2	2	6
2	1147	3.0	2.5	3.0	4.0	4.0	3.0	0	1	0	2	0	1	0	1	0	0	4	madison	2	1	5	2	3
2	1148	3.0	2.5	3.0	3.0	4.0	2.5	0	0	1	3	1	0	0	0	0	0	1	culpeper	3	1	4	1	1
2	1152	4.0	4.0	1.0	3.0	3.0	4.0	1	1	1	3	1	1	0	1	0	20	.	augusta	3	2	4	3	7
2	1155	4.0	3.0	2.0	3.0	3.0	3.0	0	1	2	0	0	1	0	1	0	0	3	page	3	1	4	3	6
2	1162	3.0	2.5	3.0	4.0	4.0	3.0	0	1	1	0	0	0	0	0	0	25	.	poquoson	3	2	5	6	8
2	1172	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	1	0	1	0	1	0	0	2	augusta	3	1	1	3	5
2	1177	3.0	3.0	2.0	3.0	3.0	2.5	0	1	0	0	0	0	1	1	.	5	.	cumberland	5	1	2	2	6
2	1179	3.0	3.0	2.0	1.0	1.0	4.0	1	1	2	1	0	0	0	0	0	50	.	hanover	3	1	3	2	5

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
2	1184	4.0	3.0	2.0	3.0	3.0	4.0	1	1	3	3	0	1	0	1	0	50	.	goochland	4	1	2	5	10
2	1187	4.0	2.5	2.0	3.0	2.5	2.5	1	1	3	3	0	1	0	1	0	0	3	hanover	4	1	4	3	7
2	1189	3.0	3.0	2.0	4.0	4.0	3.0	1	1	0	0	0	0	0	1	1	40	.	chesterfield	2	1	4	5	9
2	1195	4.0	3.0	2.0	4.0	4.0	3.0	1	1	1	0	0	1	0	0	.	5	.	king william	5	1	1	1	5
2	1196	3.0	2.5	1.0	2.5	2.5	4.0	0	0	0	0	0	0	0	0	0	100	.	james city	1	1	3	6	1
2	1198	4.0	3.0	3.0	4.0	4.0	3.0	0	1	0	0	0	0	0	0	.	10	.	williamsburg	2	2	5	4	9
2	1206	3.0	4.0	2.0	4.0	3.0	3.0	1	1	0	0	0	1	0	1	1	10	.	richmond	6	2	2	4	1
2	1217	3.0	3.0	2.0	3.0	3.0	3.0	1	0	0	0	0	0	0	0	0	5	.	richmond	2	2	1	6	4
2	1221	3.0	3.0	2.0	3.0	3.0	3.0	0	1	2	0	0	0	0	0	.	15	.	richmond	3	1	3	5	6
2	1223	4.0	3.0	2.0	3.0	3.0	3.0	1	0	0	2	0	1	0	1	1	25	.	hanover	2	1	3	4	7
2	1230	4.0	3.0	3.0	4.0	4.0	4.0	0	0	0	0	0	0	0	0	1	20	.	richmond	2	1	1	5	7
2	1232	3.0	3.0	2.5	3.0	3.0	4.0	0	1	0	1	0	0	0	0	0	5	.	henrico	2	1	3	3	8
2	1234	4.0	4.0	1.0	1.0	1.0	4.0	0	1	1	0	0	0	0	0	0	0	5	henrico	7	2	2	5	.
2	1237	4.0	4.0	2.0	2.0	2.0	4.0	1	1	1	0	0	0	0	0	0	25	.	chesterfield	4	1	3	7	10
2	1244	4.0	4.0	2.5	4.0	4.0	2.5	1	1	1	0	1	1	1	1	0	0	2	isle of wright	6	1	2	7	.
2	1245	2.5	2.5	2.5	2.5	2.5	3.0	0	1	0	0	0	0	0	0	0	5	.	chesapeake	4	1	4	4	8
2	1248	3.0	3.0	3.0	2.0	.	3.0	0	0	0	0	0	0	0	0	0	0	2	chesapeake	2	2	4	3	4
2	1249	3.0	2.5	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	20	.	chesapeake	5	1	2	3	4
2	1252	3.0	3.0	2.0	2.0	2.5	3.0	0	1	1	0	0	0	0	0	0	5	.	chesapeake	4	1	2	2	3
2	1253	.	3.0	2.5	.	2.0	.	0	0	0	0	0	0	0	0	0	0	5	chesapeake	6	2	1	2	1
2	1254	3.0	2.5	2.5	2.5	2.5	4.0	1	1	0	0	0	1	0	0	0	100	.	chesapeake	5	1	2	3	10
2	1258	3.0	3.0	3.0	3.0	3.0	4.0	1	1	1	1	0	0	0	0	0	25	.	isle of wright	2	2	2	7	8
2	1269	2.5	2.5	2.5	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	4	virginia beach	4	2	1	4	2
2	1283	3.0	3.0	3.0	4.0	3.0	4.0	1	1	1	2	0	0	0	0	0	10	.	virginia beach	2	1	2	3	6
2	1300	4.0	3.0	3.0	.	3.0	3.0	0	0	1	0	0	0	0	0	0	0	5	norfolk	6	2	1	5	4
2	1315	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	1	0	1	1	30	.	newport news	6	1	2	4	6
2	1325	4.0	4.0	1.0	2.0	2.0	3.0	0	1	2	0	0	0	0	0	0	0	2	newport news	7	1	2	3	.
2	1334	4.0	4.0	2.0	2.5	2.5	2.5	0	0	0	0	0	0	0	1	0	0	1	hampton	4	1	5	4	9
2	1335	3.0	2.5	2.5	3.0	3.0	2.5	0	1	0	0	0	0	0	0	0	0	4	hampton	5	2	1	4	6
2	1353	3.0	4.0	4.0	4.0	2.5	4.0	0	1	7	1	0	0	0	0	0	0	2	petersburg	2	2	3	2	.
2	1359	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	1	0	5	.	chesterfield	3	2	4	4	7
2	1362	4.0	4.0	2.0	4.0	4.0	4.0	0	1	0	0	1	1	1	1	0	25	.	dinwiddie	3	2	3	6	4
2	1365	4.0	4.0	1.0	3.0	3.0	3.0	1	1	4	6	1	1	1	1	0	0	1	southampton	2	1	3	5	6
2	1374	4.0	2.5	2.0	4.0	3.0	4.0	1	1	0	0	0	0	0	0	0	0	2	mecklenburg	5	1	3	3	3
2	1382	2.5	4.0	2.0	2.5	2.0	3.0	0	1	0	1	0	0	0	0	0	5	.	roanoke	3	2	3	4	1
2	1383	3.0	3.0	2.0	3.0	3.0	3.0	1	1	6	4	0	0	0	1	1	0	3	roanoke	3	1	4	4	6
2	1384	3.0	3.0	2.5	3.0	3.0	3.0	0	0	1	0	0	0	0	0	0	10	.	roanoke	6	2	2	5	10
2	1386	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	1	1	1	1	0	0	3	roanoke	7	1	3	3	1
2	1389	4.0	3.0	2.0	2.5	2.5	3.0	1	1	0	0	0	0	0	0	0	0	2	roanoke	5	1	2	7	5
2	1390	3.0	2.5	2.0	2.5	2.5	3.0	0	1	0	0	0	0	0	1	0	0	4	roanoke	6	1	2	5	8
2	1412	4.0	3.0	1.0	.	2.5	4.0	0	0	0	1	0	1	0	1	0	0	2	montgomery	4	1	3	1	9
2	1413	3.0	3.0	2.0	3.0	3.0	2.5	0	1	0	0	0	0	0	0	0	0	2	montgomery	5	1	2	2	3
2	1424	4.0	4.0	3.0	3.0	2.0	3.0	0	1	0	0	0	1	0	0	0	0	2	bristol	3	1	2	2	1
2	1425	3.0	3.0	2.5	4.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	4	bristol	5	2	3	3	4
2	1432	4.0	4.0	1.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	5	.	scott	5	2	3	3	2
2	1445	3.0	4.0	2.0	3.0	3.0	4.0	1	1	4	4	0	0	0	0	0	10	.	carroll	4	1	2	2	.
2	1449	4.0	4.0	2.0	2.5	3.0	3.0	0	1	0	0	0	0	0	0	0	0	5	smyth	3	2	4	3	2
2	1451	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	3	0	0	0	0	0	5	.	smyth	3	1	3	3	6
2	1452	3.0	3.0	2.0	2.5	2.5	2.5	0	1	0	0	0	0	0	1	0	0	2	floyd	5	1	2	1	1
2	1454	4.0	4.0	2.0	3.0	3.0	4.0	1	1	3	0	0	1	1	1	0	10	.	augusta	3	1	4	4	4
2	1455	3.0	3.0	2.0	3.0	3.0	3.0	0	0	1	3	0	0	0	0	0	0	11	augusta	2	1	4	4	6
2	1459	4.0	3.0	1.0	2.5	4.0	3.0	0	1	0	0	0	0	0	0	0	0	1	alleghany	7	1	1	2	2

ST	SN	Q1A	Q1B	.Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	.Q17	Q18
2	1464	.	.	.	.	.	.	0	0	0	0	0	0	0	0	0	0	2	rockbridge	4	2	1	3	1
2	1469	4.0	4.0	2.5	2.5	2.5	3.0	1	1	0	1	0	0	0	0	0	0	2	lynchberg	5	1	3	6	7
2	1470	4.0	2.5	3.0	4.0	4.0	4.0	0	0	0	0	0	0	0	0	0	5	.	lynchberg	6	2	1	7	9
2	1476	4.0	2.5	2.5	4.0	4.0	3.0	0	1	0	0	0	1	0	1	0	0	2	pittsylvania	5	2	2	4	4
2	1477	.	.	.	.	.	.	.	.	.	.	.	.	0	1	0	0	5	pittsylvania	1	1	2	3	5
2	1480	4.0	3.0	3.0	4.0	4.0	4.0	1	1	0	2	0	0	0	1	0	10	.	pittsylvania	1	1	4	4	7
2	1491	3.0	4.0	2.0	3.0	3.0	3.0	1	1	4	3	1	1	1	1	0	0	2	campbell	4	1	3	3	7
2	1495	.	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	tazewell	5	2	2	3	1
2	1497	4.0	4.0	3.0	3.0	3.0	3.0	0	0	2	3	0	1	0	0	0	10	.	tazewell	2	1	4	4	6
2	1499	3.0	3.0	2.0	4.0	4.0	3.0	0	0	1	0	0	0	0	0	0	0	2	tazewell	3	1	1	6	6
2	2006	4.0	3.0	2.0	2.0	2.0	3.0	1	1	4	2	0	0	0	0	0	5	.	fairfax	4	1	5	7	9
2	2044	3.0	4.0	2.0	4.0	4.0	4.0	1	1	2	2	0	0	0	0	0	20	.	fairfax	6	1	1	2	3
2	2047	3.0	3.0	2.0	4.0	4.0	3.0	1	1	0	1	0	0	0	0	0	5	.	fairfax	3	1	4	6	9
2	2052	4.0	3.0	2.0	4.0	3.0	3.0	0	1	0	0	0	0	0	0	0	5	.	fairfax	4	1	2	7	8
2	2088	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	0	0	0	0	0	0	1	arlington	3	2	3	7	7
2	2100	3.0	3.0	2.5	2.5	2.5	3.0	0	1	0	0	0	0	0	0	0	0	3	fairfax	2	2	3	4	.
2	2104	3.0	2.5	4.0	4.0	4.0	4.0	1	0	0	0	0	0	0	0	0	5	.	fairfax	5	2	1	4	7
2	2113	2.5	2.5	2.0	3.0	3.0	3.0	1	0	0	0	0	0	0	0	0	25	.	fairfax	2	2	2	6	10
2	2121	3.0	2.5	3.0	3.0	2.5	3.0	1	1	3	0	0	0	0	0	0	0	2	spotsylvania	6	1	2	4	3
2	2129	4.0	4.0	2.0	4.0	4.0	4.0	1	1	3	0	1	1	1	1	0	20	.	orange	2	1	5	3	7
2	2136	4.0	4.0	1.0	1.0	1.0	4.0	0	1	0	1	0	0	0	0	0	0	2	frederick	1	2	3	6	3
2	2183	3.0	3.0	3.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	15	.	fluvana	3	1	1	7	4
2	2201	4.0	3.0	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	0	0	25	.	richmond	2	1	1	5	7
2	2233	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	0	2	henrico	5	1	4	3	8
2	2261	4.0	4.0	3.0	4.0	4.0	3.0	0	1	0	0	0	1	0	1	0	0	2	suffolk	4	1	5	4	5
2	2291	4.0	4.0	4.0	4.0	4.0	4.0	0	0	0	0	0	0	0	0	0	5	.	norfolk	3	1	7	5	7
2	2317	3.0	3.0	4.0	4.0	4.0	4.0	.	1	4	5	0	0	0	0	1	25	.	newport news	2	1	3	4	6
2	2329	4.0	4.0	1.0	4.0	3.0	4.0	1	1	1	3	0	0	0	0	0	0	4	gloucester	4	1	3	4	10
2	2351	4.0	4.0	2.0	3.0	3.0	4.0	0	1	0	1	0	1	0	0	1	10	.	chesterfield	3	1	3	3	8
2	2355	4.0	4.0	2.0	4.0	4.0	3.0	0	1	0	0	0	1	0	1	0	5	.	petersburg	2	2	2	4	4
2	2380	3.0	3.0	2.5	3.0	3.0	4.0	0	1	0	1	0	0	0	0	0	25	0	roanoke	1	1	2	3	6
2	2421	4.0	2.5	2.0	2.0	2.0	4.0	0	1	0	1	0	0	0	1	0	0	1	franklin	5	1	2	1	2
2	2431	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	wise	2	2	4	4	7
2	2433	4.0	4.0	2.0	3.0	3.0	4.0	1	1	1	2	0	1	0	0	1	25	.	wise	2	1	5	3	1
2	2481	4.0	3.0	2.0	3.0	2.0	3.0	0	0	2	3	0	0	0	0	0	5	.	pittsylvania	5	1	7	5	10
2	2489	4.0	4.0	2.5	3.0	3.0	3.0	1	1	0	3	0	0	0	0	0	0	5	amherst	2	1	3	2	.
2	2490	4.0	3.0	.	4.0	4.0	4.0	1	1	2	2	0	0	0	0	0	10	.	rockbridge	3	1	3	5	7
2	2493	4.0	4.0	2.0	4.0	4.0	4.0	1	1	6	4	1	1	1	1	1	5	.	pittsylvania	3	1	3	3	7
2	3306	4.0	3.0	2.0	2.0	2.0	3.0	1	1	0	0	0	0	0	0	0	0	2	norfolk	5	2	2	3	1
2	3333	4.0	4.0	2.5	3.0	3.0	4.0	0	1	0	0	0	0	0	0	.	0	2	hampton	1	1	2	3	.
2	3411	4.0	3.0	2.0	2.5	2.5	4.0	1	1	0	0	0	1	0	1	0	0	2	giles	5	1	2	3	7
2	3487	3.0	4.0	2.0	4.0	4.0	3.0	1	1	0	0	0	1	1	1	0	25	.	halifax	5	1	4	4	6
3	2	3.0	2.5	4.0	4.0	4.0	3.0	1	1	0	0	0	0	0	0	0	0	2	fairfax	2	1	1	6	6
3	8	3.0	3.0	2.0	3.0	3.0	3.0	0	0	2	2	0	0	0	0	1	10	.	fairfax	3	1	3	7	10
3	12	4.0	4.0	4.0	4.0	4.0	4.0	1	1	0	1	0	1	0	1	0	0	2	prince william	2	1	2	6	7
3	22	4.0	4.0	2.0	4.0	4.0	4.0	1	1	1	1	0	0	0	0	1	50	.	fairfax	2	1	2	3	6
3	30	3.0	3.0	4.0	4.0	4.0	4.0	1	1	0	1	0	0	0	0	1	15	.	prince william	2	2	2	5	7
3	33	3.0	3.0	2.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	25	.	fairfax	2	2	2	3	9
3	34	4.0	3.0	3.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	20	.	fairfax	3	2	5	5	6
3	50	3.0	3.0	3.0	4.0	4.0	4.0	1	1	3	1	0	1	0	1	0	20	.	fauquier	4	1	3	5	6
3	69	4.0	3.0	1.0	4.0	4.0	4.0	1	1	2	5	0	0	0	0	0	0	4	prince william	6	1	2	4	7
3	73	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	25	.	prince william	2	1	4	5	10

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
3	74	4.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	1	0	1	0	0	1	prince william	4	1	1	3	7
3	86	3.0	3.0	2.0	3.0	3.0	3.0	0	1	2	0	0	0	0	1	0	100	.	fairfax	2	2	2	7	6
3	89	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	2	0	0	0	0	1	115	.	fairfax	5	1	3	7	9
3	99	3.0	2.5	2.0	4.0	4.0	4.0	1	0	1	0	0	0	0	1	1	10	.	fairfax	3	1	1	4	5
3	116	3.0	4.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	fairfax	2	1	1	7	8
3	117	2.5	2.5	2.5	3.0	3.0	2.5	1	0	0	0	0	0	0	1	0	5	.	fairfax	3	1	1	6	1
3	120	3.0	3.0	3.0	4.0	4.0	4.0	1	1	2	4	0	1	0	0	1	25	.	spotsylvania	3	1	3	7	7
3	121	3.0	3.0	3.0	3.0	3.0	3.0	1	1	0	1	0	0	0	0	1	25	.	spotsylvania	3	2	6	5	8
3	122	4.0	4.0	2.0	4.0	4.0	3.0	1	1	0	1	0	0	0	0	0	50	.	stafford	3	1	3	3	5
3	125	3.0	3.0	3.0	4.0	4.0	3.0	1	1	0	0	0	1	0	1	1	0	4	richmondc	3	1	4	4	6
3	129	4.0	3.0	2.0	3.0	2.5	3.0	1	0	0	0	0	1	0	1	0	0	2	king george	4	1	2	4	7
3	138	4.0	4.0	3.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	5	.	clarke	6	1	3	1	6
3	141	4.0	3.0	2.0	3.0	3.0	3.0	1	1	2	3	0	1	0	1	0	0	4	frederick	5	1	2	3	2
3	142	3.0	2.5	2.0	3.0	3.0	3.0	1	1	2	0	0	0	0	1	1	30	.	shenandoah	2	1	4	5	6
3	146	4.0	4.0	1.0	4.0	4.0	3.0	0	1	0	2	1	1	1	1	0	0	5	culpeper	3	1	7	6	10
3	152	4.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	1	0	1	0	0	4	rockingham	4	1	3	3	8
3	155	4.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	1	[illegible]	0	0	0	50	.	page	7	1	3	4	9
3	156	4.0	4.0	3.0	4.0	4.0	4.0	0	1	0	1	.	1	0	1	0	0	4	augusta	5	1	4	3	3
3	158	3.0	3.0	2.0	3.0	3.0	4.0	1	1	0	0	0	0	0	0	1	25	.	albemarle	5	2	2	4	1
3	162	3.0	4.0	2.0	3.0	4.0	3.0	1	1	1	0	0	0	0	0	0	30	.	albemarle	4	1	3	7	6
3	167	3.0	3.0	3.0	4.0	3.0	3.0	0	1	1	2	0	0	1	0	.	0	2	orange	6	1	2	2	1
3	172	4.0	3.0	1.0	3.0	3.0	2.5	0	0	0	0	0	0	0	0	0	0	2	augusta	4	1	3	7	.
3	192	3.0	3.0	1.0	2.5	2.5	2.5	1	1	2	3	0	0	0	0	1	0	1	.	.	.	.	.	.
3	194	4.0	4.0	2.0	4.0	4.0	3.0	0	1	1	1	0	0	0	1	0	10	.	hanover	3	1	4	5	8
3	201	4.0	4.0	1.0	1.0	1.0	4.0	1	1	0	0	0	0	0	0	0	0	3	richmond	3	1	4	2	1
3	202	3.0	2.5	4.0	4.0	4.0	4.0	1	1	1	1	0	0	0	0	0	100	.	richmond	5	2	2	7	10
3	204	3.0	3.0	2.0	4.0	3.0	3.0	1	1	1	2	0	0	0	0	0	20	.	richmond	2	2	2	7	10
3	214	4.0	3.0	2.0	4.0	3.0	3.0	1	1	0	0	0	0	0	1	0	70	.	richmond	2	1	2	6	7
3	223	3.0	4.0	2.0	3.0	3.0	3.0	1	1	1	1	1	0	0	0	0	0	2	henrico	6	1	2	4	1
3	228	3.0	4.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	100	.	henrico	2	2	3	4	6
3	229	3.0	3.0	3.0	1.0	3.0	4.0	1	1	1	1	0	0	0	1	0	0	4	henrico	2	1	6	3	5
3	233	4.0	4.0	1.0	3.0	3.0	4.0	1	1	1	0	0	0	0	0	0	5	.	richmond	4	1	5	5	7
3	241	3.0	4.0	2.0	3.0	3.0	4.0	0	1	1	2	0	0	0	0	0	50	.	chesterfield	2	1	4	7	7
3	247	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	1	1	1	0	25	.	chesapeake	4	1	2	4	10
3	252	4.0	4.0	3.0	4.0	4.0	3.0	0	1	1	1	0	1	0	1	0	5	.	chesapeake	3	1	3	2	4
3	259	4.0	3.0	2.0	3.0	3.0	4.0	1	1	1	1	0	1	0	1	0	50	.	suffolk	3	2	4	4	9
3	263	.	.	.	.	.	.	.	.	.	.	.	.	1	1	0	10	.	suffolk	6	1	2	4	4
3	266	4.0	3.0	3.0	4.0	4.0	4.0	0	0	0	0	0	0	0	0	0	10	.	virginia beach	6	1	1	3	1
3	271	3.0	3.0	2.0	3.0	3.0	4.0	1	1	0	3	0	0	0	0	0	20	.	gloucester	2	1	6	4	6
3	274	3.0	2.5	2.0	3.0	3.0	3.0	0	1	1	1	0	0	0	0	0	0	1	virginia beach	3	1	5	7	10
3	276	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	1	20	.	virginia beach	1	2	3	4	2
3	278	.	4.0	1.0	3.0	3.0	3.0	1	1	0	0	0	1	0	1	1	50	.	virginia beach	3	2	3	7	6
3	280	4.0	3.0	2.0	3.0	3.0	4.0	1	1	2	2	0	0	0	0	0	5	.	virginia beach	2	2	3	5	6
3	282	3.0	3.0	1.0	3.0	3.0	3.0	1	1	0	1	0	0	0	0	1	0	2	virginia beach	2	1	2	4	7
3	285	4.0	2.5	2.0	3.0	3.0	3.0	1	1	3	3	0	1	0	0	0	0	2	hanover	5	1	4	4	6
3	286	4.0	4.0	2.0	4.0	4.0	3.0	1	1	1	1	0	0	0	0	0	100	.	virginia beach	3	1	4	3	10
3	287	2.5	.	4.0	4.0	4.0	3.0	1	1	2	0	0	0	0	0	0	25	.	virginia beach	3	1	4	7	8
3	291	3.0	3.0	2.0	2.0	2.0	.	0	1	1	0	0	0	0	0	0	0	4	norfolk	5	1	1	7	10
3	303	4.0	3.0	4.0	4.0	4.0	4.0	1	1	5	0	0	0	0	0	1	65	.	norfolk	4	1	2	7	10
3	311	3.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	1	1	5	.	norfolk	5	2	2	5	6
3	331	4.0	3.0	2.0	3.0	3.0	4.0	1	1	1	0	0	0	0	0	0	115	.	hampton	2	2	5	3	2
3	333	4.0	3.0	2.0	3.0	3.0	4.0	0	1	4	3	0	1	0	1	1	20	.	hampton	3	1	4	4	9

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
3	339	3	.	2.0	3.0	4.0	3.0	1	1	0	1	0	0	0	0	0	5	.		.	.	.	.	.
3	352	4	4.0	1.0	3.0	3.0	3.0	0	0	1	0	0	0	0	0	0	10	.	petersburg	2	1	1	5	4
3	354	3	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	1	0	1	0	50	.	petersburg	6	1	1	5	1
3	355	.	2.5	2.5	2.5	2.5	3.0	1	1	1	2	0	0	0	0	0	0	2	brunswick	5	1	2	1	1
3	359	4	4.0	3.0	3.0	3.0	3.0	0	1	0	1	0	0	0	0	0	5	.		4	1	2	3	.
3	361	4	4.0	1.0	4.0	3.0	3.0	1	1	2	3	0	1	0	1	0	0	2	southampton	4	1	2	4	6
3	366	3	3.0	2.0	3.0	3.0	3.0	1	1	3	2	0	0	0	0	0	0	4	hopewell	3	1	2	3	5
3	369	4	4.0	1.0	3.0	3.0	3.0	0	0	0	0	1	1	0	1	0	0	1	dinwiddie	3	1	3	3	7
3	377	3	3.0	2.0	3.0	3.0	2.5	0	1	0	0	1	1	1	1	0	0	4	appamattox	7	1	2	5	5
3	380	4	3.0	.	3.0	3.0	3.0	0	1	3	0	0	0	0	0	0	0	5	roanoke	7	1	1	1	2
3	382	4	4.0	2.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	0	5	roanoke	6	2	2	4	3
3	383	4	3.0	1.0	2.0	1.0	4.0	1	0	0	0	0	0	0	0	0	0	1	roanoke	3	1	5	7	6
3	385	3	3.0	2.0	3.0	3.0	4.0	0	1	0	0	0	0	0	0	0	25	.	roanoke	3	1	1	5	.
3	390	4	3.0	.	3.0	.	3.0	0	1	0	1	0	0	0	0	0	0	2	roanoke	6	1	2	4	4
3	392	3	3.0	2.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	0	50	.	roanoke	3	1	5	4	7
3	398	4	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	1	0	0	3	montgomery	1	1	1	6	2
3	400	4	3.0	3.0	4.0	4.0	3.0	1	1	2	1	0	1	0	1	0	15	.	montgomery	4	1	4	3	5
3	401	4	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	10	.	montgomery	5	1	2	3	3
3	405	4	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	1	0	0	0	0	5	floyd	5	1	2	4	2
3	406	3	3.0	2.0	4.0	4.0	3.0	1	1	1	4	0	0	0	1	0	0	1	franklin	3	1	4	4	6
3	408	4	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	5	.	henry	6	1	1	6	2
3	414	3	3.0	2.5	4.0	4.0	3.0	1	1	5	4	0	0	0	1	0	15	.	henry	2	1	3	3	7
3	418	4	3.0	2.0	2.5	2.5	3.0	0	1	1	3	0	0	0	0	0	50	.	roanoke	5	1	2	4	10
3	419	3	3.0	2.0	5.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	5	patrick	5	1	2	3	3
3	430	3	3.0	3.0	3.0	3.0	3.0	0	0	0	0	0	1	0	1	0	5	.	dickenson	6	1	2	4	6
3	434	4	4.0	1.0	3.0	3.0	3.0	1	1	0	1	0	1	1	1	0	0	1	scott	4	1	4	7	7
3	436	3	3.0	2.0	2.0	3.0	3.0	1	0	1	3	1	0	1	1	0	5	.	russell	3	1	4	2	.
3	437	4	4.0	1.0	3.0	3.0	4.0	1	1	3	3	1	1	1	1	0	0	1	washington	3	1	4	5	8
3	442	4	3.0	2.0	2.0	2.0	3.0	1	1	0	2	0	0	0	0	0	0	1	wythe	5	1	2	4	4
3	450	4	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	1	0	1	0	10	.	wythe	2	1	3	4	6
3	454	4	3.0	3.0	4.0	4.0	4.0	1	0	2	3	0	1	0	1	0	0	2	augusta	3	1	2	7	6
3	455	4	3.0	2.0	3.0	4.0	3.0	0	1	0	2	0	0	0	0	0	0	4	augusta	6	1	2	1	1
3	457	3	3.0	2.0	2.0	2.0	3.0	0	0	2	2	1	1	.	.	0	0	1	augusta	5	1	2	1	3
3	475	4	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	0	1	campbell	3	1	3	2	4
3	478	3	3.0	3.0	4.0	4.0	3.0	0	1	1	1	0	0	0	0	0	10	.	pittsylvania	2	2	4	3	5
3	484	3	3.0	2.0	2.5	2.5	3.0	1	1	0	0	0	0	0	1	0	10	.	bedford	4	1	1	5	3
3	485	4	4.0	2.0	4.0	4.0	3.0	1	1	2	3	0	1	0	1	0	0	2	campbell	3	1	4	3	2
3	491	.	3.0	3.0	4.0	4.0	4.0	0	1	3	3	0	1	0	1	0	50	.	albemarle	6	1	2	5	8
3	1001	4	3.0	4.0	4.0	4.0	4.0	1	1	2	0	0	1	0	1	1	50	.	frederick	3	2	2	7	4
3	1020	3	3.0	2.0	4.0	4.0	3.0	1	1	2	0	0	0	0	0	0	10	.	fairfax	3	2	4	6	.
3	1021	3	3.0	3.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	0	2	fairfax	3	1	2	5	9
3	1032	4	2.5	2.5	4.0	4.0	3.0	0	1	1	1	0	0	0	1	0	5	.	fairfax	1	1	2	4	8
3	1038	4	4.0	3.0	4.0	4.0	4.0	1	1	1	0	0	1	0	1	1	10	.	fairfax	3	2	2	7	10
3	1057	3	3.0	2.0	4.0	3.0	4.0	0	1	1	0	0	0	0	0	0	0	2	fairfax	3	2	3	4	8
3	1059	4	3.0	3.0	3.0	3.0	4.0	1	1	1	0	0	1	0	1	0	0	4	fairfax	2	1	2	4	7
3	1062	4	4.0	1.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	0	2	loudoun	2	1	2	5	7
3	1070	4	4.0	1.0	4.0	4.0	4.0	1	1	4	4	0	0	0	0	0	100	.	prince william	4	1	4	7	10
3	1072	3	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	1	1	30	.	prince william	3	1	4	7	8
3	1081	3	3.0	2.5	2.5	1.0	3.0	0	0	0	0	0	0	0	0	0	0	2	arlington	5	2	1	4	2
3	1082	3	3.0	3.0	4.0	4.0	3.0	0	1	0	0	0	[illegible]	0	0	0	5	.	arlington	5	1	3	3	6
3	1083	3	3.0	3.0	4.0	4.0	3.0	0	0	1	0	0	0	0	0	0	10	.	arlington	4	1	6	7	4
3	1085	4	4.0	2.0	3.0	3.0	3.0	0	1	1	0	0	1	0	1	1	25	.	arlington	5	1	3	7	10

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
3	1093	4.0	3.0	2.0	3.0	3.0	2.5	1	1	2	1	0	0	0	0	0	0	5	arlington	5	1	2	4	.
3	1096	3.0	3.0	2.0	3.0	3.0	3.0	0	0	1	0	0	0	0	0	0	0	2	fairfax	2	1	2	5	6
3	1102	3.0	4.0	2.0	3.0	2.0	3.0	1	1	0	0	0	0	0	1	0	5	.	fairfax	4	2	5	2	9
3	1103	4.0	3.0	2.0	2.5	2.5	4.0	1	1	1	0	0	0	0	0	0	50	.	fairfax	3	2	3	3	8
3	1126	4.0	4.0	2.0	4.0	4.0	3.0	1	1	2	0	0	1	0	1	0	0	4	northumberland	4	2	3	3	.
3	1134	4.0	3.0	3.0	4.0	4.0	3.0	1	1	2	3	0	1	0	1	0	5	.	caroline	2	1	3	4	2
3	1135	3.0	4.0	1.0	2.0	2.0	3.0	1	1	1	4	0	1	1	1	0	0	2	frederick	5	1	2	2	6
3	1139	3.0	3.0	3.0	3.0	4.0	4.0	1	1	2	0	0	1	0	1	0	25	.	wallen	3	1	4	5	7
3	1140	4.0	3.0	3.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	50	.	fauquier	2	2	4	5	8
3	1145	4.0	3.0	2.0	2.5	3.0	3.0	0	0	1	3	0	1	0	1	0	0	2	culpeper	2	1	5	4	4
3	1148	3.0	3.0	2.0	3.0	2.0	3.0	0	1	1	0	0	0	0	0	0	25	.	madison	6	1	1	7	8
3	1149	4.0	4.0	2.0	3.0	3.0	3.0	1	0	2	3	0	1	0	1	0	5	.	augusta	2	1	2	5	5
3	1150	3.0	3.0	2.0	.	.	3.0	0	1	0	3	0	0	0	1	0	0	5	rockingham	2	1	2	4	6
3	1161	4.0	4.0	1.0	4.0	4.0	4.0	1	1	1	1	0	0	0	0	0	25	.	albemarle	5	1	2	4	7
3	1169	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	1	0	1	0	1	0	0	3	lancaster	4	1	4	7	8
3	1171	3.0	2.5	2.5	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	10	.	waynesboro	5	2	1	4	7
3	1179	3.0	4.0	3.0	4.0	3.0	3.0	0	1	1	2	0	1	0	0	0	10	.	gloucester	4	1	3	2	9
3	1182	4.0	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	1	hampton	1	2	4	4	6
3	1183	3.0	3.0	2.0	3.0	2.0	3.0	1	1	0	3	0	1	0	1	0	5	.	king and queen	4	1	5	7	2
3	1186	4.0	3.0	3.0	4.0	4.0	4.0	1	1	4	0	0	0	0	0	1	5	4	hanover	4	1	2	3	7
3	1187	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	5	.	hanover	2	2	4	5	6
3	1197	4.0	4.0	4.0	4.0	4.0	4.0	1	1	4	0	0	1	0	0	1	25	.	james city	6	1	2	4	4
3	1200	4.0	3.0	2.0	3.0	3.0	4.0	1	1	2	0	0	0	0	0	1	15	.	richmond	5	1	2	4	3
3	1211	4.0	4.0	2.0	2.0	2.0	3.0	0	1	0	0	0	0	0	0	0	0	10	richmond	6	2	4	2	1
3	1220	4.0	4.0	4.0	4.0	3.0	4.0	0	1	0	0	0	1	0	0	0	25	.	henrico	4	1	2	3	8
3	1221	4.0	2.5	2.0	4.0	4.0	3.0	1	1	2	0	0	1	0	1	0	10	.	richmond	6	2	1	4	2
3	1238	4.0	3.0	2.0	3.0	3.0	3.0	1	1	3	4	0	0	0	1	0	100	.	richmond	4	1	4	3	10
3	1248	3.0	3.0	2.5	3.0	3.0	2.5	0	1	0	0	0	0	0	0	.	0	5	chesapeake	3	2	5	3	4
3	1257	3.0	3.0	3.0	3.0	3.0	4.0	1	1	0	1	1	1	0	1	0	0	2	accomack	4	1	3	3	6
3	1260	4.0	3.0	2.0	2.0	3.0	3.0	0	0	1	0	0	0	0	0	0	0	4	suffolk	7	2	1	1	1
3	1262	3.0	4.0	3.0	4.0	4.0	3.0	1	1	0	2	0	1	0	1	1	0	4	suffolk	3	1	4	3	6
3	1265	4.0	3.0	3.0	4.0	4.0	4.0	0	1	2	3	0	0	0	0	1	5	.	virginia beach	3	1	3	4	9
3	1281	3.0	3.0	3.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	0	20	.	virginia beach	2	1	3	4	7
3	1305	3.0	.	3.0	4.0	4.0	3.0	0	0	0	0	0	0	0	0	1	50	.	norfolk	2	2	3	4	7
3	1306	3.0	4.0	4.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	5	.	norfolk	7	1	2	.	1
3	1310	4.0	4.0	2.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	0	0	10	norfolk	1	2	5	5	4
3	1319	4.0	4.0	2.0	3.0	3.0	2.5	0	0	0	0	0	0	0	0	0	0	2	james city	4	2	3	7	5
3	1320	4.0	4.0	.	2.5	2.5	4.0	0	1	0	0	0	0	0	0	0	0	4	newport news	4	1	2	4	.
3	1323	3.0	2.5	2.5	3.0	3.0	3.0	0	0	0	1	0	0	0	0	0	5	.	newport news	1	1	3	5	6
3	1324	4.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	10	.	warwick	2	2	3	4	4
3	1325	3.0	2.5	2.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	10	.	newport news	2	1	2	5	8
3	1335	2.5	2.5	2.0	3.0	3.0	4.0	1	0	2	0	0	0	0	1	1	0	2	hampton	2	1	1	5	5
3	1338	4.0	3.0	2.0	4.0	3.0	3.0	0	0	0	0	0	0	0	0	.	0	4	hampton	3	1	4	6	.
3	1342	4.0	4.0	2.0	3.0	3.0	3.0	1	0	0	0	0	0	0	0	0	10	.	portsmouth	4	2	4	4	.
3	1344	4.0	3.0	1.0	2.5	3.0	3.0	1	0	3	4	0	0	0	1	1	20	.	portsmouth	2	2	4	4	4
3	1347	.	.	.	.	.	.	.	.	.	.	.	.	0	0	0	0	4	portsmouth	5	1	4	1	2
3	1356	3.0	4.0	1.0	2.0	2.0	4.0	0	1	0	3	1	1	0	0	0	0	2	prince george	2	1	3	4	6
3	1362	3.0	3.0	3.0	2.0	3.0	3.0	0	1	0	3	0	0	0	0	0	0	3	dinwiddie	4	1	2	2	5
3	1367	3.0	3.0	2.5	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	2	hopewell	6	2	.	1	.
3	1371	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	1	0	0	0	0	0	0	2	prince edward	3	1	4	3	4
3	1372	3.0	4.0	2.5	3.0	3.0	3.0	1	1	2	3	0	1	0	1	0	0	3	mecklenburg	3	1	4	2	6
3	1397	3.0	3.0	2.5	3.0	3.0	4.0	1	0	0	0	0	1	0	0	0	15	.	loudoun	1	1	3	5	3

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
3	1412	4.0	3.0	3.0	3.0	4.0	3.0	1	1	0	0	0	1	0	1	0	25	.	roanoke	5	2	1	4	1
3	1417	3.0	2.5	2.0	3.0	2.5	3.0	0	0	0	0	0	0	0	0	0	0	2	roanoke	.	2	1	3	.
3	1420	4.0	4.0	1.0	2.0	3.0	3.0	1	0	2	0	0	0	1	1	0	0	1	botetourt	3	1	4	6	7
3	1422	4.0	4.0	2.0	2.0	1.0	.	0	1	1	3	0	0	0	0	0	0	1	roanoke	4	2	2	1	1
3	1428	3.0	3.0	3.0	3.0	3.0	3.0	.	1	0	0	0	0	0	0	0	0	4	wise	5	2	2	3	.
3	1429	4.0	4.0	3.0	3.0	3.0	3.0	1	1	2	2	0	1	0	1	0	0	2	russell	3	1	3	7	.
3	1431	3.0	3.0	3.0	4.0	3.0	3.0	1	1	7	4	0	0	0	1	0	50	.	washington	3	1	3	4	4
3	1433	4.0	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	10	.	scott	4	2	3	3	6
3	1438	4.0	4.0	.	2.0	1.0	3.0	0	1	0	0	0	.	0	0	0	0	10	lee	6	1	2	1	5
3	1446	3.0	3.0	2.0	3.0	2.5	2.5	.	1	0	0	0	0	1	1	0	0	5	carroll	6	2	1	1	1
3	1447	3.0	3.0	2.0	2.5	3.0	3.0	0	1	2	3	1	1	0	1	0	0	2	carroll	5	1	2	4	6
3	1460	4.0	4.0	2.0	2.5	2.5	4.0	1	1	4	3	0	0	0	0	0	0	4	bath	3	1	1	4	3
3	1463	4.0	4.0	3.0	4.0	3.0	3.0	1	1	0	0	0	1	0	1	0	0	11	albemarle	5	1	2	5	10
3	1468	4.0	3.0	2.0	4.0	4.0	4.0	0	0	0	0	0	0	0	0	0	5	.	lynchburg	2	1	2	5	6
3	1473	3.0	3.0	2.0	2.5	3.0	3.0	0	1	0	1	0	0	0	1	0	0	4	amherst	6	1	3	2	1
3	1481	4.0	3.0	2.0	3.0	4.0	3.0	1	1	0	0	1	1	0	1	0	0	5	pittsylvania	6	2	2	4	5
3	1489	4.0	4.0	1.0	2.5	2.5	3.0	1	1	5	0	0	1	.	1	0	0	4	amherst	7	1	2	1	1
3	1499	4.0	3.0	2.0	4.0	4.0	3.0	1	1	0	3	0	0	0	0	0	20	.	buchanan	3	2	3	5	7
3	2023	3.0	3.0	2.5	2.5	2.5	3.0	0	1	0	0	0	0	0	0	0	0	3	fairfax	5	1	4	1	7
3	2027	4.0	2.5	1.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	5	.	fairfax	5	2	2	4	8
3	2029	3.0	2.5	2.0	4.0	4.0	4.0	1	1	1	2	0	0	0	0	1	75	.	fairfax	2	1	2	3	5
3	2039	3.0	4.0	1.0	3.0	2.5	3.0	1	1	1	5	0	0	0	1	0	0	1	arlington	2	1	2	5	7
3	2049	3.0	4.0	2.5	2.5	2.5	3.0	0	0	0	2	0	0	0	0	0	0	2	prince william	4	1	2	5	.
3	2054	4.0	4.0	2.0	4.0	4.0	4.0	0	1	1	0	0	0	0	0	0	0	2	fairfax	2	1	4	1	9
3	2056	2.5	2.5	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	4	fairfax	2	1	4	6	8
3	2067	4.0	4.0	1.0	3.0	2.0	3.0	0	1	3	0	0	0	0	0	0	0	1	fairfax	4	1	4	6	10
3	2075	4	4.0	2.0	4.0	4.0	4.0	1	1	1	2	0	1	0	1	0	0	4	prince william	2	1	4	3	7
3	2079	3	3.0	2.0	1.0	1.0	4.0	1	0	0	0	0	0	0	1	0	0	2	arlington	4	2	1	4	6
3	2088	4	3.0	4.0	4.0	4.0	3.0	0	0	2	0	0	0	0	0	0	25	.	arlington	3	2	3	5	7
3	2091	4	3.0	3.0	4.0	4.0	4.0	0	0	1	2	0	0	0	0	0	25	.	arlington	3	1	3	7	9
3	2098	4	3.0	1.0	1.0	1.0	4.0	0	0	0	0	0	0	0	0	0	0	1	fairfax	3	2	1	5	7
3	2104	4	2.5	2.5	4.0	4.0	4.0	1	1	1	1	0	0	0	0	0	25	.	fairfax	4	1	3	6	10
3	2107	3	3.0	4.0	4.0	3.0	4.0	1	1	4	3	0	0	0	0	1	50	.	fairfax	3	1	4	4	10
3	2110	3	2.5	2.0	4.0	3.0	3.0	1	1	2	0	0	0	0	0	1	50	.	fairfax	2	2	2	6	7
3	2137	4	4.0	3.0	3.0	3.0	3.0	1	1	2	0	0	1	1	0	0	25	.	frederick	2	2	5	3	4
3	2143	4	4.0	2.5	2.5	2.5	4.0	0	1	0	0	0	1	0	0	0	0	1	frederick	5	1	2	3	5
3	2180	3	3.0	2.5	3.0	4.0	3.0	0	1	0	2	0	0	0	0	0	0	2	goochland	4	2	2	3	1
3	2184	.	.	.	.	.	.	0	1	0	0	0	0	0	0	0	0	2	mathews	5	1	2	6	7
3	2189	3	3.0	3.0	4.0	4.0	4.0	1	1	1	0	0	1	0	0	0	200	0	chesterfield	3	1	3	5	8
3	2193	4	4.0	2.0	3.0	3.0	3.0	1	1	2	2	1	1	0	0	0	0	5	king and queen	4	1	3	3	5
3	2224	4	4.0	2.0	4.0	4.0	4.0	1	1	3	1	1	1	0	1	1	25	.	henrico	3	2	5	6	6
3	2234	4	4.0	2.0	4.0	3.0	3.0	0	0	1	3	0	1	0	1	0	25	.	henrico	3	1	3	4	7
3	2254	4	4.0	2.0	3.0	3.0	4.0	1	1	2	4	0	0	0	0	0	10	.	chesapeake	1	1	4	3	5
3	2258	4	3.0	2.0	3.0	3.0	.	0	0	0	0	0	1	0	1	0	5	.	isle of wright	5	2	2	3	2
3	2273	4	3.0	3.0	3.0	3.0	3.0	1	1	0	0	0	1	0	0	0	10	.	chesterfield	1	2	3	4	5
3	2304	4	3.0	2.0	3.0	2.0	3.0	0	0	0	0	0	0	0	0	0	25	.	norfolk	5	1	3	3	7
3	2312	4	4.0	3.0	4.0	4.0	4.0	1	1	1	1	0	1	0	1	1	5	.	norfolk	2	1	3	4	7
3	2343	3	4.0	1.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	0	4	portsmouth	4	1	8	4	.
3	2373	4	3.0	2.0	3.0	3.0	3.0	0	1	0	3	1	0	1	1	0	0	3	nottoway	6	1	2	3	1
3	2387	3	3.0	2.0	4.0	4.0	3.0	1	1	0	2	0	0	0	1	0	0	11	roanoke	5	1	1	6	6
3	2391	3	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	40	.	roanoke	6	2	1	3	4
3	2399	4	3.0	3.0	3.0	3.0	3.0	1	1	0	2	0	1	0	0	0	0	2	botetourt	5	1	2	2	3

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
3	2404	3.0	3.0	2.0	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	4	henry	4	2	3	2	3
3	2407	3.0	4.0	2.5	3.0	3.0	3.0	0	0	0	2	0	0	0	0	0	0	9	henry	2	1	2	5	4
3	2410	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	1	1	0	1	0	0	2	bedford	5	1	3	2	.
3	2432	3.0	3.0	2.0	3.0	3.0	3.0	1	1	4	3	1	1	1	1	0	50	.	scott	1	1	7	3	2
3	2464	4.0	2.5	2.0	4.0	3.0	3.0	1	0	1	0	0	1	0	1	0	20	.	augusta	3	1	5	3	2
3	2477	4.0	3.0	2.0	3.0	3.0	4.0	1	1	1	3	0	1	0	1	0	50	.	pittsylvania	7	1	2	1	8
3	2496	4.0	3.0	2.0	2.0	2.5	3.0	0	0	0	0	0	0	0	0	0	5	.	.	.	.	.	.	.
3	3256	4.0	3.0	2.0	4.0	1.0	4.0	0	1	0	0	0	1	0	0	0	0	5	accomac	2	1	3	3	.
3	3336	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	hampton	4	1	3	3	6
3	3456	4.0	3.0	2.0	3.0	3.0	.	1	0	0	0	0	0	0	0	0	0	2	augusta	6	2	2	4	.
3	3471	4.0	4.0	2.5	4.0	4.0	4.0	1	1	0	0	0	0	0	0	0	0	8		5	2	1	3	1
4	6	3.0	2.5	3.0	4.0	4.0	4.0	1	1	0	0	0	0	0	0	1	5	.	fairfax	2	2	2	5	9
4	8	3.0	3.0	3.0	4.0	4.0	4.0	1	1	5	1	0	0	0	0	0	25	.	fairfax	3	1	2	4	9
4	9	3.0	3.0	1.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	25	.	fairfax	2	1	3	5	8
4	11	4.0	4.0	2.5	3.0	3.0	4.0	1	1	2	1	0	1	0	1	0	10	.	fauquier	4	1	2	5	10
4	13	4.0	3.0	4.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	1	100	.	fairfax	6	1	1	3	6
4	15	3.0	4.0	3.0	4.0	4.0	4.0	1	0	1	1	0	0	0	0	1	50	.	fairfax	2	2	3	6	7
4	17	3.0	3.0	2.0	2.0	2.0	3.0	0	1	1	0	0	0	0	0	0	0	2	fairfax	7	1	2	5	7
4	30	3.0	4.0	3.0	4.0	4.0	3.0	0	1	0	0	0	0	0	0	0	25	.	fairfax	3	1	5	7	10
4	33	3.0	3.0	2.0	4.0	4.0	3.0	1	1	1	0	0	0	0	0	0	30	.	fairfax	2	1	4	3	4
4	35	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	1	0	0	0	0	0	5	.	loudoun	4	1	2	3	6
4	40	4.0	4.0	3.0	1.0	4.0	4.0	1	1	2	5	0	0	0	0	.	10	.	fairfax	3	2	6	3	10
4	45	4.0	3.0	2.0	4.0	4.0	3.0	1	0	4	5	0	0	0	0	0	0	2	prince william	1	1	2	4	6
4	48	3.0	3.0	2.0	4.0	3.0	3.0	0	1	2	0	0	0	0	0	0	10	.	prince william	4	1	4	7	10
4	53	3.0	2.5	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	10	.	loudoun	3	1	2	5	6
4	56	3.0	3.0	1.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	1	0	2	fairfax	2	2	3	5	10
4	59	4.0	3.0	2.0	4.0	4.0	3.0	0	1	1	0	0	0	0	1	0	10	.	fairfax	4	1	2	7	10
4	60	3.0	3.0	2.0	4.0	4.0	3.0	0	1	1	1	0	0	0	0	0	20	.	loudoun	4	1	1	4	7
4	61	3.0	3.0	2.5	4.0	4.0	3.0	1	1	1	1	0	0	0	0	0	5	.	loudoun	2	2	4	5	7
4	63	3.0	2.5	2.0	3.0	3.0	4.0	1	1	3	0	0	0	0	1	0	0	6	fairfax	4	1	3	5	10
4	64	3.0	3.0	2.0	2.5	3.0	4.0	1	1	0	0	0	0	0	0	0	0	5	fairfax	6	1	2	4	7
4	65	3.0	3.0	2.5	3.0	3.0	3.0	0	1	1	2	0	0	0	1	0	10	.	fairfax	4	1	1	6	7
4	69	4.0	3.0	2.0	3.0	3.0	4.0	1	1	1	3	0	1	0	1	0	100	.	prince william	3	1	2	4	10
4	73	4.0	2.5	1.0	4.0	4.0	3.0	1	1	1	0	0	0	0	0	0	0	4	prince william	5	1	2	7	7
4	82	2.5	2.5	2.5	4.0	4.0	2.5	0	1	1	3	0	0	0	1	1	0	2	arlington	2	1	3	6	7
4	87	3.0	2.5	3.0	4.0	4.0	3.0	1	0	0	0	0	0	0	0	0	20	.	fairfax	3	2	1	7	6
4	89	3.0	2.5	3.0	4.0	4.0	3.0	0	0	2	0	0	(	0	0	0	10	.	arlington	5	2	1	6	5
4	91	4.0	3.0	2.5	4.0	4.0	4.0	1	1	1	1	0	[illegible]	0	0	0	15	.	arlington	6	1	2	3	2
4	94	2.5	2.5	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	25	.	fairfax	4	2	4	7	10
4	95	3.0	4.0	2.0	1.0	1.0	4.0	1	1	1	0	0	0	0	1	0	5	.	fairfax	3	1	4	5	9
4	98	3.0	3.0	3.0	4.0	4.0	3.0	1	1	3	4	0	0	0	0	0	25	.	fairfax	4	1	2	5	10
4	104	3.0	3.0	2.0	4.0	3.0	4.0	0	1	1	2	0	0	1	1	0	25	.	fairfax	5	1	2	5	7
4	105	4.0	3.0	2.0	3.0	3.0	3.0	1	1	2	0	0	1	0	1	0	10	.	fairfax	6	1	2	7	9
4	110	3.0	3.0	2.0	3.0	3.0	3.0	1	1	3	4	0	1	0	0	1	100	.	fairfax	3	1	3	5	10
4	111	3.0	2.5	2.0	2.0	3.0	3.0	0	0	1	1	0	0	0	0	0	0	4	fairfax	7	1	2	7	3
4	113	3.0	3.0	2.0	3.0	3.0	2.5	0	1	0	0	0	0	0	1	1	0	2	fairfax	3	1	3	5	10
4	119	3.0	2.5	2.0	3.0	4.0	2.5	0	1	0	0	0	0	0	1	0	0	2	spotsylvania	3	1	4	4	7
4	123	.	3.0	4.0	4.0	4.0	3.0	1	1	1	0	0	0	0	0	0	5	.	caroline	3	2	4	4	2
4	129	4.0	4.0	3.0	3.0	3.0	3.0	0	0	0	3	0	1	0	1	0	0	2	caroline	3	1	2	1	5
4	131	3.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	50	.	s+afford	5	1	2	4	7
4	133	4.0	4.0	1.0	3.0	3.0	3.0	0	0	0	0	0	1	0	1	0	0	2	richmondc	3	1	3	4	7
4	136	4.0	3.0	1.0	2.5	2.5	3.0	1	1	2	0	0	1	0	1	1	0	5	frederick	5	1	2	4	.

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
4	140	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	1	100	.	warren	4	1	3	3	7
4	144	4.0	4.0	4.0	4.0	4.0	4.0	0	1	2	0	0	1	0	1	0	0	2	culpeper	6	1	3	2	.
4	147	4.0	3.0	2.0	4.0	4.0	3.0	0	0	0	1	0	1	0	1	0	5	.	fauquier	1	1	2	4	6
4	154	4.0	3.0	2.0	2.5	2.5	3.0	0	1	0	0	0	1	0	1	0	0	4	rockingham	6	1	2	3	.
4	157	3.0	3.0	2.0	4.0	3.0	4.0	1	1	4	3	0	0	0	1	0	10	.	page	2	1	3	3	5
4	160	3.0	3.0	2.0	3.0	4.0	3.0	0	0	0	0	0	0	0	0	1	15	.	albemarle	3	1	4	7	9
4	161	4.0	3.0	2.0	3.0	3.0	3.0	1	1	2	1	0	1	1	1	0	0	4	albemarle	4	1	4	4	6
4	165	4.0	4.0	3.0	4.0	4.0	4.0	1	1	0	0	0	0	0	1	0	100	.	albermarle	1	2	2	7	5
4	166	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	3	0	0	0	0	0	0	2	albemarle	6	1	2	4	3
4	167	3.0	3.0	2.0	4.0	4.0	3.0	0	1	5	0	0	0	0	0	1	10	.	orange	4	1	5	7	10
4	170	3.0	3.0	2.5	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	greene	3	2	2	3	3
4	171	3.0	3.0	2.0	4.0	4.0	4.0	0	0	0	0	1	1	1	1	0	115	.	augusta	5	1	4	4	9
4	177	4.0	4.0	1.0	4.0	2.5	4.0	1	1	2	4	0	1	0	1	0	0	2	middlesex	5	1	3	5	8
4	182	3.0	3.0	2.0	3.0	4.0	3.0	1	1	1	0	0	0	0	0	0	5	.	norfolk	3	2	3	4	6
4	183	3.0	4.0	3.0	4.0	4.0	4.0	1	1	2	0	0	0	0	0	0	25	.	louisa	3	2	4	4	1
4	185	4.0	2.5	2.0	3.0	3.0	3.0	1	0	1	0	0	1	0	1	0	20	.	hanover	3	1	4	5	7
4	186	3.0	3.0	2.0	3.0	3.0	3.0	1	0	2	1	0	0	0	0	0	5	.	hanover	2	1	4	5	7
4	187	3.0	2.5	2.5	3.0	3.0	3.0	0	1	0	0	0	0	0	0	1	10	.	chesterfield	3	1	4	7	9
4	189	3.0	3.0	2.5	3.0	3.0	3.0	1	1	1	1	0	0	0	0	0	1	.	chesterfield	5	1	5	3	7
4	192	4.0	3.0	2.0	4.0	3.0	3.0	1	0	0	4	0	1	0	0	0	10	.	new kent	3	1	5	5	6
4	197	3.0	3.0	2.0	3.0	3.0	4.0	1	1	0	1	0	0	0	0	0	15	.	james city	3	2	4	5	7
4	198	3.0	3.0	3.0	4.0	4.0	3.0	0	1	0	0	0	0	0	0	0	0	4	james city	5	1	2	7	8
4	204	3.0	2.5	2.0	3,0	3.0	3.0	1	1	5	4	1	1	0	0	1	0	8	richmond	5	1	2	7	10
4	211	4.0	4.0	2.5	2.0	1.0	3.0	0	1	0	1	0	0	0	1	0	75	.	richmond	3	1	2	2	8
4	214	4.0	2.5	3.0	4.0	4.0	3.0	1	1	0	0	0	0	0	0	0	0	3	richmond	3	1	1	4	5
4	215	3.0	3.0	2.5	2.5	2.5	3.0	0	0	0	2	0	1	0	1	0	0	2	richmond	1	1	1	7	6
4	218	4.0	4.0	1.0	1.0	1.0	2.5	0	0	0	0	0	0	0	0	0	0	2	richmond	7	1	2	7	1
4	219	4.0	3.0	1.0	1.0	2.0	3.0	0	0	0	0	0	1	0	1	0	0	1	richmond	7	2	1	2	1
4	226	3.0	.	.	.	.	.	0	0	0	0	0	0	0	0	0	5	.	henrico	4	2	2	4	8
4	227	4.0	3.0	2.5	2.5	2.5	3.0	1	0	7	3	0	1	0	0	1	0	5	richmond	6	1	2	7	1
4	233	3.0	3.0	3.0	4.0	4.0	.	0	0	0	0	0	0	0	0	0	10	.	henrico	2	2	2	5	6
4	234	4.0	4.0	2.5	2.0	4.0	4.0	1	1	2	0	0	0	0	0	0	0	2	richmond	3	2	3	4	9
4	241	4.0	4.0	1.0	4.0	3.0	3.0	1	1	2	3	0	1	0	0	0	5	.	richmond	3	1	4	7	9
4	242	3.0	3.0	2.0	4.0	4.0	3.0	1	1	1	0	0	0	0	0	0	25	.	richmond	4	2	2	5	.
4	248	4.0	4.0	3.0	3.0	4.0	3.0	1	1	2	0	0	0	0	0	1	50	.	chesapeake	6	1	3	7	4
4	250	2.5	2.5	2.5	2.0	2.0	3.0	0	1	0	0	0	0	0	0	0	0	2	chesapeake	4	1	2	3	6
4	251	4.0	4.0	2.0	3.0	3.0	4.0	1	1	1	0	0	1	0	1	0	0	4	chesapeake	3	1	4	4	8
4	255	3.0	2.5	3.0	4.0	4.0	3.0	1	0	2	2	0	0	0	0	0	0	4	accomack	5	1	1	4	5
4	264	3.0	2.5	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	2	virginia beach	5	2	1	4	2
4	272	3.0	4.0	2.0	4.0	4.0	4.0	1	1	1	0	0	0	0	0	1	25	.	virginia beach	3	1	4	7	6
4	273	4.0	4.0	2.0	4.0	3.0	4.0	1	0	2	3	0	0	0	1	0	25	.	virginia beach	2	1	3	5	7
4	274	4.0	3.0	2.0	3.0	3.0	3.0	1	1	2	1	0	1	1	1	0	0	2	virginia beach	4	1	3	5	10
4	276	4.0	2.5	3.0	3.0	3.0	3.0	0	0	0	1	0	0	0	0	1	60	.	virginia beach	3	1	5	5	6
4	285	4.0	4.0	3.0	3.0	4.0	3.0	1	1	2	0	0	0	0	0	0	0	4	virginia beach	5	1	2	4	5
4	297	3.0	3.0	3.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	2	norfolk	2	2	3	4	2
4	302	3.0	2.5	2.5	3.0	3.0	4.0	0	1	0	0	0	1	0	0	1	10	.	norfolk	1	1	2	5	1
4	314	4.0	3.0	2.0	3.0	3.0	4.0	1	1	1	0	0	0	0	1	0	0	2	newport news	7	2	1	3	1
4	316	3.0	3.0	2.5	4.0	4.0	4.0	0	1	0	0	0	0	0	0	1	20	.	newport news	2	1	2	4	3
4	321	4.0	4.0	.	4.0	4.0	4.0	1	1	6	3	0	1	0	1	1	20	.	norfolk	3	1	3	6	5
4	322	4.0	3.0	2.0	4.0	3.0	4.0	1	1	1	0	0	1	0	1	0	25	.	newport news	6	1	2	7	6
4	341	4.0	4.0	2.0	2.0	2.0	2.5	0	0	0	0	0	1	0	0	0	15	.	portsmouth	3	1	4	4	6
4	350	.	3.0	3.0	2.0	2.0	3.0	0	0	0	1	0	0	0	0	0	0	2	petersburg	2	2	5	3	3

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
4	351	4.0	3.0	3.0	4.0	4.0	4.0	1	1	2	0	0	1	0	1	1	100	.	petersburg	7	1	2	6	6
4	357	4.0	4.0	2.0	3.0	3.0	4.0	1	1	0	1	0	0	0	1	0	100	.	chesterfield	4	1	3	7	10
4	359	4.0	4.0	2.0	4.0	4.0	4.0	1	1	2	3	1	0	0	1	1	5	.	colonial heights	2	1	3	2	3
4	360	3.0	3.0	1.0	3.0	3.0	3.0	1	0	1	2	0	0	0	0	0	5	.	colonial heights	3	1	4	7	8
4	369	4.0	3.0	1.0	3.0	3.0	3.0	1	1	3	4	1	1	1	1	1	0	7	southampton	3	1	4	4	8
4	374	4.0	3.0	1.0	2.0	2.5	2.5	0	1	0	1	1	1	1	1	0	0	2	mecklenburg	6	2	1	3	2
4	378	3.0	3.0	2.0	3.0	3.0	2.5	0	1	0	0	0	0	0	0	0	0	2	luenburg	5	2	1	6	1
4	381	3.0	3.0	1.0	2.0	1.0	2.5	0	1	4	0	1	1	1	1	0	0	1	roanoke	5	2	2	4	5
4	383	3.0	2.5	2.0	3.0	3.0	3.0	1	1	2	0	0	0	0	1	0	0	2	roanoke	2	2	1	4	4
4	389	3.0	3.0	2.0	4.0	4.0	4.0	1	1	1	0	0	1	0	1	1	10	.	roanoke	1	1	3	5	6
4	391	4.0	4.0	1.0	4.0	4.0	4.0	1	1	0	1	0	0	0	0	1	25	.	roanoke	3	1	6	7	10
4	397	4.0	4.0	1.0	4.0	4.0	4.0	1	1	3	2	0	1	0	1	1	100	.	montgomery	3	1	4	7	10
4	402	4.0	4.0	2.0	4.0	4.0	4.0	1	1	5	6	0	1	0	1	0	25	.	pulaski	4	1	2	5	10
4	404	4.0	4.0	2.0	4.0	3.0	3.0	1	1	0	2	0	1	0	1	0	0	2	botetourt	1	2	2	3	3
4	405	.	.	.	.	.	.	.	1	0	0	1	.	1	1	0	1	.	franklin	7	2	1	.	.
4	413	3.0	2.5	2.0	2.0	3.0	3.0	0	0	0	0	0	0	0	0	0	10	.	montgomery	3	1	2	7	9
4	414	4.0	3.0	2.0	3.0	3.0	3.0	1	1	4	3	0	1	0	1	0	25	.	franklin	3	1	4	3	6
4	416	3.0	4.0	2.0	3.0	3.0	3.0	0	1	0	3	0	0	0	0	0	0	5		.	.	.	.	.
4	417	3.0	3.0	3.0	3.0	4.0	3.0	1	1	1	0	0	0	0	1	1	50	.	roanoke	6	1	2	4	.
4	419	4.0	3.0	2.0	4.0	4.0	4.0	1	1	2	2	1	1	1	1	0	0	2	patrick	2	1	3	6	7
4	420	3.0	3.0	3.0	3.0	4.0	3.0	0	1	1	2	0	1	0	1	0	0	2	botetourt	5	1	3	3	8
4	422	4.0	4.0	2.0	3.0	3.0	3.0	1	1	2	1	0	1	0	1	0	0	2	roanoke	2	1	1	7	10
4	426	3.0	3.0	2.0	2.5	2.5	2.5	0	1	1	0	0	0	1	1	0	0	10	washington	5	1	2	4	10
4	430	4.0	3.0	2.0	2.0	2.5	4.0	0	1	0	0	0	0	0	0	0	5	.	wise	4	1	4	4	5
4	432	3.0	3.0	2.0	3.0	3.0	3.0	0	1	2	3	0	0	0	1	0	0	3	scott	3	1	4	4	3
4	437	4.0	4.0	1.0	3.0	2.5	2.5	0	1	0	0	.	0	1	1	0	0	1	scott	7	1	2	2	.
4	440	4.0	4.0	1.0	3.0	4.0	3.0	0	1	0	0	0	0	0	0	0	5	.	wise	4	1	2	7	8
4	441	4.0	4.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	1	1	0	0	4	pulaski	5	1	2	4	7
4	442	4.0	4.0	2.0	3.0	3.0	3.0	1	0	0	0	0	0	0	1	0	10	.	bland	2	2	2	5	3
4	443	4.0	4.0	1.0	2.0	2.0	3.0	1	1	1	2	0	1	0	1	0	0	1	smyth	5	1	2	1	3
4	446	4.0	3.0	1.0	3.0	4.0	4.0	0	1	0	0	0	1	0	.	0	0	1	carroll	4	1	2	1	.
4	449	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	3	0	1	0	1	0	100	.	wythe	3	1	3	2	6
4	450	4.0	4.0	1.0	1.0	1.0	4.0	1	1	0	0	0	1	0	1	0	0	1	wythe	6	2	1	1	1
4	463	3.0	4.0	1.0	4.0	4.0	2.5	1	1	2	3	1	0	1	0	0	0	3	augusta	2	1	3	4	2
4	465	3.0	3.0	3.0	4.0	4.0	2.5	1	1	1	3	0	1	0	1	0	5	.	campbell	4	1	2	1	8
4	467	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	20	.	lynchburg	4	1	2	5	8
4	468	3.0	2.5	4.0	4.0	4.0	4.0	1	1	3	3	0	0	0	0	0	0	2	lynchburg	2	1	4	4	6
4	473	3.0	3.0	2.0	4.0	4.0	4.0	1	1	0	0	0	1	0	1	0	25	.	amherst	5	2	2	4	1
4	479	4.0	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	0	3	pittsylvania	5	2	2	4	4
4	481	3.0	3.0	2.0	2.0	2.0	3.0	0	1	0	0	0	0	0	0	0	0	1	pittsylvania	6	2	1	1	1
4	482	4.0	3.0	2.0	2.0	3.0	4.0	1	1	2	0	0	0	1	1	0	0	2	pittsylvania	4	1	2	2	.
4	488	3.0	4.0	1.0	3.0	3.0	4.0	1	1	0	1	0	0	0	1	0	0	1	amherst	4	1	2	7	5
4	489	3.0	3.0	2.0	2.5	2.0	3.0	0	1	0	0	0	1	0	1	0	0	4	halifax	6	2	2	2	1
4	491	3.0	3.0	3.0	3.0	3.0	3.0	1	1	6	3	1	1	0	1	0	0	2	fluvanna	4	1	5	1	3
4	500	3.0	3.0	2.0	4.0	3.0	4.0	0	0	2	0	0	0	0	0	0	0	2	buchanan	7	2	1	7	1
4	1002	3.0	3.0	3.0	4.0	4.0	3.0	0	0	0	0	0	0	0	0	0	10	.	fairfax	3	1	2	7	10
4	1003	3.0	3.0	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	0	2	fairfax	2	2	1	7	8
4	1004	2.5	2.5	2.5	2.5	2.5	2.5	1	1	1	0	0	0	0	0	0	0	2	fairfax	4	1	3	6	10
4	1007	3.0	2.5	2.0	3.0	3.0	3.0	0	1	2	1	0	0	0	1	0	0	7	fairfax	5	1	2	4	7
4	1012	2.5	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	1	0	0	1	prince william	5	1	2	7	7
4	1014	3.0	3.0	3.0	4.0	4.0	3.0	1	1	2	1	0	0	0	0	0	50	.	fairfax	3	1	2	6	9
4	1023	2.5	2.5	2.0	3.0	3.0	3.0	1	1	2	0	0	0	0	0	1	0	4	fairfax	3	1	5	7	10

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
4	1026	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	0	0	0	0	0	5	.	fairfax	1	2	2	5	8
4	1029	3.0	2.5	2.5	4.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	fairfax	2	2	4	3	7
4	1031	4.0	3.0	3.0	2.0	3.0	3.0	0	1	1	0	0	0	0	0	0	5	.	loudoun	4	1	6	3	10
4	1038	3.0	3.0	2.0	4.0	3.0	3.0	1	1	0	0	0	0	0	0	0	50	.	fairfax	5	2	4	4	10
4	1039	4.0	3.0	2.0	4.0	4.0	4.0	0	1	0	1	0	0	0	0	0	5	.	fairfax	3	1	4	7	9
4	1047	3.0	3.0	3.0	3.0	3.0	4.0	0	0	0	0	0	0	0	0	0	0	2	prince william	7	1	2	2	1
4	1058	3.0	3.0	2.0	3.0	3.0	3.0	1	1	2	4	0	1	0	1	0	5	.	fairfax	2	1	2	3	7
4	1066	3.0	4.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	1	5	.	fairfax	2	1	4	5	8
4	1067	3.0	3.0	3.0	4.0	4.0	3.0	0	1	1	1	0	0	0	0	0	0	2	fairfax	3	2	5	5	7
4	1071	3.0	3.0	2.0	4.0	4.0	3.0	1	1	3	0	0	0	0	0	0	0	4	prince william	5	1	4	7	7
4	1076	3.0	3.0	3.0	4.0	4.0	3.0	1	1	0	0	0	0	0	0	1	2	.	arlington	2	2	1	6	4
4	1078	3.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	0	0	0	0	0	3	arlington	6	2	3	4	9
4	1079	3.0	3.0	2.0	3.0	3.0	3.0	1	0	4	1	0	0	0	0	0	0	3	arlington	3	1	1	5	9
4	1080	3.0	3.0	2.5	4.0	4.0	4.0	0	0	1	0	0	0	0	0	0	50	.	arlington	3	1	3	7	10
4	1081	4.0	3.0	2.0	4.0	4.0	3.0	1	0	4	1	0	0	0	0	0	5	.	fairfax	2	2	2	6	7
4	1085	3.0	4.0	3.0	4.0	4.0	3.0	1	1	1	0	0	0	0	0	1	0	2	fairfax	2	1	4	5	.
4	1096	2.5	2.5	2.5	2.5	2.5	4.0	0	0	0	0	0	0	0	0	0	25	.	fairfax	2	2	2	6	6
4	1097	4.0	3.0	3.0	1.0	1.0	4.0	1	1	0	0	0	0	0	0	0	15	.	fairfax	6	2	1	3	.
4	1099	4.0	4.0	2.0	4.0	3.0	4.0	0	1	0	0	0	0	0	0	0	25	.	fairfax	5	1	1	5	3
4	1107	3.0	3.0	3.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	10	.	fairfax	3	1	6	7	8
4	1108	4.0	4.0	3.0	4.0	4.0	3.0	0	1	0	0	0	0	0	0	0	0	4	fairfax	5	2	1	4	3
4	1112	3.0	3.0	2.5	3.0	3.0	3.0	1	1	0	0	0	0	0	0	1	25	.	fairfax	1	2	2	6	10
4	1114	3.0	2.5	2.0	3.0	3.0	3.0	0	0	0	0	0	0	0	0	0	10	.	fairfax	3	1	1	7	5
4	1117	4.0	4.0	1.0	3.0	3.0	3.0	1	0	1	0	0	1	0	1	0	100	.	fairfax	3	1	4	7	10
4	1124	3.0	2.5	3.0	4.0	3.0	4.0	0	1	0	0	0	1	0	0	0	0	4	westmoreland	5	2	2	3	.
4	1137	4.0	4.0	3.0	1.0	1.0	3.0	0	1	6	2	0	1	0	1	0	25	.	frederick	5	1	2	1	3
4	1139	4.0	2.5	3.0	4.0	4.0	3.0	1	1	3	3	0	0	0	.	0	115	.	warren	4	1	4	3	9
4	1145	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	0	2	culpeper	5	2	1	3	.
4	1146	3.0	3.0	2.0	3.0	2.0	3.0	0	1	5	0	0	0	0	0	1	75	.	madison	1	1	6	4	6
4	1151	4.0	3.0	1.0	4.0	3.0	4.0	0	1	0	0	0	0	0	0	0	10	.	rockingham	4	2	1	1	1
4	1162	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	0	3	augusta	5	2	1	5	.
4	1163	2.5	4.0	.	3.0	3.0	3.0	1	0	0	0	0	0	0	0	0	15	.	albemarle	1	1	1	4	1
4	1173	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	1	0	1	0	0	2	amelia	5	1	3	1	.
4	1178	4.0	4.0	2.5	1.0	2.5	4.0	0	1	0	0	0	1	0	1	0	0	2	henrico	5	1	3	1	3
4	1184	3.0	2.5	2.0	3.0	3.0	3.0	0	0	1	3	0	1	0	1	0	0	2	hanover	3	1	6	6	7
4	1191	4.0	3.0	3.0	4.0	4.0	3.0	0	1	1	0	0	1	1	1	0	20	.	powhatan	4	2	8	5	10
4	1193	4.0	3.0	2.0	3.0	3.0	3.0	1	1	1	1	0	0	1	1	0	0	2	henrico	2	1	3	4	7
4	1201	3.0	3.0	2.0	3.0	3.0	4.0	0	0	0	0	0	0	0	0	0	20	.	richmond	1	2	3	5	5
4	1207	4.0	4.0	1.0	1.0	4.0	4.0	0	0	0	0	0	0	0	0	0	0	2	richmond	2	2	3	5	3
4	1230	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	1	25	.	richmond	2	2	1	4	3
4	1239	3.0	2.5	3.0	4.0	4.0	3.0	1	1	0	0	0	0	0	0	0	0	2	hanover	3	1	4	6	8
4	1240	4.0	3.0	2.0	2.5	2.5	3.0	1	1	0	0	0	0	0	0	0	0	2	chesterfield	7	1	1	1	1
4	1246	3.0	3.0	2.0	2.5	2.5	4.0	0	1	0	0	0	1	0	0	0	0	2	virginia beach	1	2	2	4	3
4	1262	3.0	3.0	2.0	3.0	3.0	4.0	1	1	1	0	0	0	0	0	1	10	.	suffolk	6	1	2	4	6
4	1268	3.0	3.0	3.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	1	.	virginia beach	5	1	2	5	.
4	1269	4.0	3.0	2.0	3.0	3.0	2.5	1	1	0	0	0	1	0	1	0	0	2	virginia beach	2	2	2	5	7
4	1270	3.0	3.0	2.0	3.0	2.0	3.0	1	1	1	0	0	1	0	0	0	0	8	virginia beach	2	1	3	4	6
4	1277	4.0	2.5	2.5	3.0	3.0	4.0	0	1	1	0	0	0	0	0	1	0	2	virginia beach	4	1	2	3	10
4	1279	3.0	2.5	2.0	2.0	2.0	2.5	1	1	1	0	0	0	0	0	0	0	2	virginia beach	6	2	4	3	6
4	1282	4.0	3.0	3.0	4.0	4.0	4.0	1	0	0	0	0	0	0	0	0	0	4	virginia beach	1	1	2	5	6
4	1284	3.0	3.0	3.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	5	virginia beach	5	2	1	3	2
4	1287	4.0	3.0	2.0	3.0	3.0	2.5	0	1	3	0	0	1	0	0	1	5	.	virginia beach	3	1	5	5	.

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
4	1289	4.0	3.0	1.0	4.0	4.0	3.0	0	0	1	0	0	0	0	0	0	0	2	virginia beach	2	2	2	7	10
4	1291	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	20	.	norfolk	3	1	1	5	5
4	1305	3.0	3.0	2.0	3.0	4.0	3.0	1	1	2	0	0	1	0	1	1	0	4	norfolk	5	1	2	3	6
4	1306	3.0	3.0	2.0	2.5	2.5	2.5	0	1	0	0	0	0	0	1	0	0	10	.	6	1	2	1	6
4	1313	3.0	2.5	2.0	3.0	3.0	3.0	0	0	0	0	0	1	0	0	0	0	4	newport news	5	1	2	4	7
4	1317	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	0	0	10	.	newport news	3	1	4	7	9
4	1331	3.0	3.0	3.0	2.0	3.0	3.0	0	1	2	0	0	0	0	1	.	0	2	hampton	7	1	2	2	1
4	1335	3.0	2.5	2.0	3.0	3.0	3.0	0	1	0	1	0	0	0	0	0	0	2	hampton	1	1	1	3	4
4	1343	3.0	3.0	2.0	3.0	3.0	4.0	1	1	0	0	0	0	0	0	0	0	4	portsmouth	4	1	3	3	8
4	1348	4.0	4.0	4.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	0	2	portsmouth	5	2	1	3	1
4	1361	4.0	4.0	1.0	2.5	2.5	3.0	1	1	0	0	0	1	0	1	0	0	2	surry	6	1	2	2	1
4	1363	4.0	3.0	2.0	2.0	2.0	4.0	0	0	0	3	0	1	0	1	0	25	.	greensville	3	1	4	5	7
4	1367	4.0	3.0	2.0	4.0	3.0	3.0	0	1	0	3	0	0	0	0	0	40	.	hopewell	2	2	2	5	8
4	1373	4.0	3.0	4.0	4.0	4.0	3.0	0	0	2	0	0	1	1	1	0	25	.	charlotte	6	1	12	7	10
4	1375	4.0	4.0	1.0	2.0	2.0	3.0	0	1	0	0	0	1	1	1	0	10	.	buckingham	5	1	5	5	7
4	1376	3.0	4.0	4.0	4.0	4.0	3.0	0	1	0	0	0	0	0	0	0	5	.	lunenburg	6	2	1	3	1
4	1379	2.5	2.5	2.0	3.0	3.0	3.0	1	1	0	0	0	0	0	0	0	5	.	roanoke	2	2	4	3	3
4	1386	3.0	3.0	3.0	4.0	4.0	4.0	1	1	2	0	0	0	0	0	0	40	.	roanoke	2	2	2	6	8
4	1393	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	.	0	5	pittsylvania	7	1	2	1	1
4	1394	3.0	3.0	2.0	3.0	3.0	3.0	0	1	0	2	0	0	0	0	0	0	5	.	6	1	1	.	1
4	1398	4.0	4.0	1.0	3.0	3.0	3.0	0	1	0	2	0	0	0	0	0	0	2	bedford	4	1	3	2	5
4	1403	4.0	4.0	2.0	2.0	2.0	3.0	1	1	3	0	1	1	1	1	0	0	2	montgomery	5	1	2	1	.
4	1409	4.0	3.0	2.0	2.5	3.0	2.5	1	1	0	0	0	0	0	0	0	0	2	patrick	7	2	1	1	1
4	1415	3.0	3.0	2.5	2.5	4.0	4.0	0	1	1	3	0	0	0	0	0	0	4	franklin	4	1	3	4	7
4	1421	3.0	3.0	2.0	4.0	4.0	3.0	1	1	1	0	0	0	0	0	0	0	2	franklin	2	1	5	7	7
4	1425	3.0	3.0	2.0	4.0	4.0	3.0	0	1	2	3	0	0	1	1	0	20	.	washington	2	1	4	4	4
4	1431	3.0	3.0	3.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	russell	3	2	3	4	2
4	1433	4.0	4.0	1.0	3.0	3.0	4.0	1	1	2	3	0	0	0	1	0	0	3	scott	3	1	3	3	.
4	1438	4.0	3.0	2.0	2.0	2.0	4.0	1	1	2	3	0	1	0	1	1	5	.	lee	4	1	2	4	.
4	1439	2.5	2.5	2.5	2.5	2.5	2.5	0	0	0	0	0	0	0	0	0	0	2	lee	4	2	1	3	2
4	1444	3.0	3.0	2.0	3.0	3.0	3.0	1	1	2	2	0	0	1	1	0	0	2	grayson	2	1	2	5	4
4	1447	.	.	.	.	.	.	1	1	0	0	0	0	0	0	0	0	10	grayson	5	1	2	1	1
4	1454	4.0	3.0	1.0	1.0	1.0	3.0	0	1	0	0	0	1	0	1	0	0	1	northumberland	6	1	2	4	1
4	1456	4.0	3.0	2.5	1.0	3.0	4.0	1	1	4	0	0	0	0	0	0	25	.	rockbridge	6	1	2	1	1
4	1457	3.0	3.0	2.0	4.0	4.0	4.0	1	1	2	4	0	1	0	1	0	0	2	augusta	2	1	2	3	2
4	1458	3.0	.	.	.	.	.	0	1	0	0	0	0	0	0	0	10	.	alleghany	6	2	1	4	2
4	1466	.	.	.	.	.	.	0	1	0	0	0	0	0	0	0	0	5	lynchburg	5	2	2	1	.
4	1469	4.0	3.0	2.0	4.0	3.0	4.0	0	0	0	0	0	0	0	0	0	0	2	lynchburg	7	1	2	.	.
4	1470	4.0	3.0	2.0	2.0	2.0	3.0	0	1	1	0	0	1	0	1	0	0	2	lynchburg	6	1	2	3	6
4	1480	3.0	3.0	2.0	3.0	3.0	4.0	0	1	0	0	0	0	0	1	0	50	.	bristol	2	1	2	5	4
4	1484	4.0	3.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	50	.	bedford	4	1	3	5	10
4	1486	3.0	3.0	2.0	3.0	3.0	3.0	0	1	1	0	0	1	0	1	0	0	2	pittsylvania	2	2	3	4	6
4	1492	3.0	3.0	2.0	2.0	2.0	3.0	1	1	4	1	0	0	0	0	0	20	.	halifax	2	1	5	3	1
4	1494	3.0	3.0	3.0	3.0	3.0	4.0	1	1	0	2	0	1	0	1	0	0	2	tazewell	5	1	3	2	2
4	1498	4.0	4.0	1.0	4.0	4.0	4.0	1	1	4	3	0	0	0	0	0	0	5	tazewell	3	1	4	1	1
4	2032	4.0	4.0	2.0	3.0	3.0	4.0	1	1	0	3	0	0	0	0	1	0	2	fairfax	2	.	6	3	3
4	2034	3.0	3.0	2.0	3.0	3.0	3.0	1	1	0	2	0	1	0	1	0	0	11	fairfax	5	1	3	4	5
4	2036	4.0	3.0	4.0	4.0	4.0	3.0	1	1	1	0	0	0	0	1	0	0	4	fairfax	4	1	5	7	10
4	2054	4.0	4.0	2.0	3.0	3.0	4.0	1	1	0	0	0	0	0	0	0	25	.	fairfax	2	2	4	2	5
4	2090	3.0	3.0	2.0	4.0	4.0	3.0	1	1	0	0	0	0	0	0	0	50	.	arlington	4	2	4	4	10
4	2109	3.0	3.0	2.0	3.0	3.0	3.0	1	1	1	0	0	0	0	1	0	10	.	fairfax	2	1	4	3	10
4	2120	4.0	3.0	2.0	4.0	3.0	4.0	0	0	2	1	0	0	0	0	0	75	.	spotsylvania	4	1	7	3	7

ST	SN	Q1A	Q1B	Q1C	Q1D	Q1E	Q1F	Q2	Q3	MAGS	LISC	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13A	Q14	Q15	Q16	Q17	Q18
4	2122	4	4.0	1.0	4.0	4.0	4.0	0	1	0	0	0	0	0	0	0	5	.	stafford	4	2	1	2	2
4	2135	4	3.0	2.0	4.0	4.0	4.0	1	1	4	1	0	0	1	1	0	0	2	frederick	3	2	3	5	9
4	2158	4	4.0	2.0	2.5	2.5	4.0	0	0	0	0	0	0	0	0	0	0	1	albemarle	6	1	2	3	9
4	2224	3	3.0	2.0	3.0	2.5	2.5	0	0	0	0	0	0	0	0	0	0	2	henrico	1	2	2	5	6
4	2229	3	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	richmond	3	2	3	4	5
4	2311	3	3.0	3.0	4.0	4.0	4.0	1	1	2	3	0	0	.	1	0	5	.	norfolk	2	1	4	3	6
4	2312	4	3.0	2.0	3.0	3.0	3.0	1	1	1	1	0	0	0	0	0	20	.	norfolk	4	1	2	5	9
4	2336	3	4.0	2.0	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	2	hampton	2	2	5	4	6
4	2356	.	4.0	1.0	.	.	.	1	0	0	0	0	0	0	0	0	5	.	chesterfield	6	2	1	3	4
4	2370	3	4.0	2.0	4.0	4.0	3.0	0	0	1	0	1	1	0	1	0	10	.	sussex	5	1	4	7	5
4	2382	4	3.0	2.0	4.0	4.0	4.0	1	1	2	2	0	0	0	0	0	10	.	.	4	1	4	2	3
4	2388	3	4.0	2.0	3.0	3.0	3.0	0	1	0	0	0	0	0	0	0	0	2	roanoke	3	1	4	4	6
4	2408	4	4.0	2.5	2.5	3.0	3.0	1	0	3	1	0	1	0	1	0	0	2	henry	3	1	1	3	2
4	2427	3	3.0	3.0	3.0	3.0	3.0	.	1	1	0	0	0	0	0	0	0	5	.	7	1	2	1	.
4	2434	3	3.0	2.5	2.5	2.5	2.5	0	1	0	0	0	0	0	0	0	0	3	dickenson	5	2	3	1	1
4	2436	4	3.0	2.0	3.0	3.0	3.0	1	1	1	3	0	0	0	0	0	0	2	russell	2	1	4	3	6
4	2448	3	3.0	2.0	3.0	3.0	3.0	1	0	3	4	0	1	1	1	0	25	.	smyth	4	.	4	4	7
4	2476	3	3.0	2.0	3.0	3.0	3.0	1	1	2	2	1	1	1	1	0	0	2	halifax	2	1	2	5	5
4	2490	3	3.0	2.0	2.5	2.5	4.0	0	1	1	0	0	1	0	1	0	0	2	pittsylvania	5	2	2	1	2
4	3196	3	2.5	3.0	4.0	4.0	4.0	1	0	0	0	0	0	0	0	0	25	.	james city	1	2	2	5	4
4	4327	4	.	1.0	2.5	.	4.0	0	0	.	0	0	0	0	0	0	5	.	.	1	2	2	5	4
4	4461	3	.	2.0	3.0	.	3.0	1	1	.	0	0	0	0	0	0	5	.	.	5	1	2	1	1
1	1260	3	3.0	2.0	3.0	3.0	3.0	0	1	0	0	1	1	0	1	0	0	2	suffolk	7	1	2	3	

VITA

Kurt Stephenson was born March 9, 1964 in Galax Virginia. In 1982 he graduated from Franklin County High School. The following year he attended Embry-Riddle Aeronautical University at Daytona Beach, Florida. In 1983 Kurt transferred to Radford University and received his B. S. Degree in Economics there in 1986. In 1987 Kurt enrolled in the Masters program in the Department of Agricultural Economics at Virginia Tech. Kurt completed his Masters degree in July of 1988.