DISSERTATION

COMPARING METHODOLOGIES TO ESTIMATE TOURISTS'
NONCONSUMPTIVE USE VALUES OF RECREATION, ROADWAYS AND
RANCHES: INTERNATIONAL AND DOMESTIC APPLICATIONS

Submitted by:

Lindsey Jo Ellingson

Department of Agricultural and Resource Economics

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, CO

Summer 2007

UMI Number: 3279507

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

UMI®

UMI Microform 3279507

Copyright 2007 by ProQuest Information and Learning Company.

All rights reserved. This microform edition is protected against unauthorized copying under Title 17, United States Code.
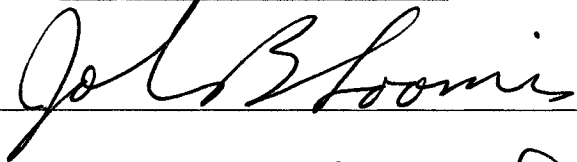
ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346
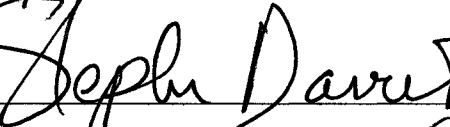
COLORADO STATE UNIVERSITY

June 29, 2007

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER
OUR SUPERVISION BY LINDSEY ELLINGSON ENTITLED COMPARING
METHODOLOGIES TO ESTIMATE TOURISTS' NONCONSUMPTIVE USE VALUES OF
RECREATION, ROADWAYS AND RANCHES: INTERNATIONAL AND DOMESTIC
APPLICATIONS BE ACCEPTED AS FULLFILLING IN PART REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY.
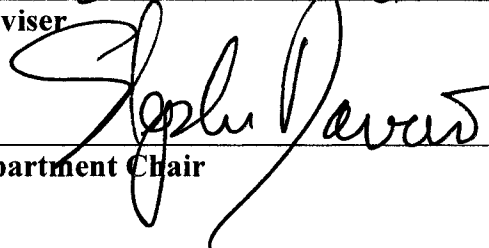
Committee on Graduate Work

_____

_____

_____

Adviser _____

Department Chair _____

ii

ABSTRACT OF DISSERTATION

COMPARING METHODOLOGIES TO ESTIMATE TOURISTS'
NONCONSUMPTIVE USE VALUES OF RECREATION, ROADWAYS AND
RANCHES: INTERNATIONAL AND DOMESTIC APPLICATIONS

The objective of this dissertation is to compare two nonmarket valuation methods to estimate tourists' nonconsumptive use values of scenic viewscapes in three applications. The two nonmarket valuation techniques analyzed are the contingent behavior and contingent valuation methods. The contingent behavior method asks respondents their intended visitation behavior contingent on a hypothetical change to the good or service in question. The contingent valuation method asks respondents their willingness to pay for a hypothetical change to the good or service in question.

The three applications evaluated in this research are a National Reserve in Bolivia, a scenic roadway in Argentine Patagonia and ranch open space in Routt County, Colorado. Specifically, respondents were asked their willingness to pay and travel behavior contingent on improved park service (i.e. tourist information center and naturalist guides) at Eduardo Avaroa Reserve in Bolivia. In Argentina, visitors were asked their willingness to pay and travel behavior to Glaciers National Park contingent on differing levels of development (i.e. telecommunication and mining infrastructure) along the roadway from El Calafate, the gateway community, to Glaciers National Park. For

Routt County, tourists were asked how many fewer (or more) dollars per day and number of days they would travel to Routt County if existing ranchlands were converted to urban uses (i.e. housing and other resort development).

Quantitative comparative analysis is conducted across the applications to determine whether there is a difference among contingent behavior and contingent valuation responses. The results show that the two methods produce statistical and policy relevant different results. In addition, other analyses were conducted evaluating differences based on survey elicitation languages, tour package purchases, using pictures to measure different levels of development, survey responses across time and regional impact analyses.

Lindsey Jo Ellingson
Department of Agricultural and Resource Economics
Colorado State University
Fort Collins, CO 80523
Summer 2007

iv

ACKNOWLEDGEMENTS

I would like to thank my wonderful committee members for all of their help in the completion of this dissertation. I would like to thank my advisor, Dr. Andrew Seidl, for his guidance, support, time, patience and, basically, for getting me to this point in my career. Thank you to my committee members, Dr. John Loomis, Dr. Stephen Davies and Dr. Stu Cottrell for their time, patience, valuable comments and suggestions. In addition, I would like to thank the support staff of the Department of Agricultural and Resource Economics, specifically Barb and Denise for all their help on various questions and demands of me over these last five years. I would like to thank Dr. S. Lee Gray, Dr. Marshall Frasier, Dr. James Pritchett, Dr. Stephen Koontz and Dr. Wendy Umberger for their guidance and support throughout my graduate school career.

For the research conducted in Bolivia, I would like to acknowledge the financial, logistical and data collection support of Kreg Lindberg, Oregon State University – Cascades Campus; Andy Drumm and the Staff at the Nature Conservancy Worldwide Office in Arlington, Virginia; and John Loomis, Professor, Department of Agricultural and Resource Economics, Colorado State University.

The research in Argentina would not have been possible with the financial, logistical and data collection support of the Foundation for the Future of Nature

(FUNAFU) based in Buenos Aires, Argentina; the Santa Cruz Department of Tourism; Lawrence Pratt, Associate Director, Latin America Center for Competitiveness and Sustainable Development (CLACDS), Central American Institute for Business Administration (INCAE), Costa Rica.

I would like to thank CJ Mucklow, Director, Routt County Cooperative Extension; Steamboat Ski and Resort Corporation; City of Steamboat Springs; Colorado Conservation Trust; the County Commissioners of Routt County and Colorado State University Cooperative Extension (Routt County and Colorado State University campus) for their financial, logistical and data collection support in relation to the research conducted in Routt County, Colorado. In addition, I would like to thank the graduate students whom assisted me in the collection of the data during the summer of 2005, if it were not for you guys, I would probably still be in Steamboat Springs harassing tourists.

Last, but definitely not least, to all my friends, especially, the ones I have made while in graduate school, you know who you are, thank you for everything. Thank you to my family for their unconditional support and love, for I would not have gotten here without any of you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

1.1: Introduction and Problem Statement

Natural amenities, such as scenic viewscapes, are clearly thought to provide an

integral component of recreation, tourism, amenity migration and retirement development

(Bennett, 1996; Frederick, 1993; Jakus *et al.*, 1995; Keith and Fawson, 1995; Keith *et al.*,

1996; Marcouiller, 1997; Marcouiller and Clendenning, 2005; McDonough *et al.*, 1999).

They provide the substantive but latent primary factor input into tourism industry output

(Marcouiller, 1998; Marcouiller and Clendenning, 2005; Power 1988). In addition, local

natural amenities impact local economic development by drawing tourists who spend

their money supporting the local businesses. The tourists stimulate the local economy in

that they bring additional income into the economy from outside the region that can then

circulate within the economy (Power, 2005).

Tourism is one of the world's largest and fastest growing industries (Wall, 1997).

Tourism can serve as a large source of income to a region's economy. Both developed

and developing countries heavily depend on tourism for the growth of their economies. In

the case of developing countries, a rapidly growing tourism industry has proved to be an

increasingly important source of foreign exchange inflows (Wunder, 2000).

Although markets accurately reflect the private and social value of many goods

and services, they tend to undervalue tourism and outdoor recreation experiences for at

1

least two significant reasons. First, where the natural features of a landscape are the principal draw for tourism, those features are relatively unique, creating a more inelastic demand curve than is observed for commonly purchased items. As a result, the consumer's surplus (or the value of the good or service that is not captured by the price) will be greater for nature based tourism experiences than for apples and oranges. Secondly, recreational experiences, tours or other tourist services purchased by tourists on vacation are jointly produced (or bundled) with a variety of potentially valuable attributes demonstrating public goods characteristics. These attributes, potentially including, for example, rural lifestyle, clean air, scenic landscapes and friendly people, contribute to the tourism experience and may be affected (enhanced or diminished) by local policy. The attributes involved in the tourism experience are not captured or directly illuminated by market transactions. Alterations in these features could either increase or decrease the amount of tourism activity in the local community. This would have an impact on the local economy contiguous to the tourist destination. Therefore, policies that either directly or indirectly affect the tourism industry need to take into account how the amenities may influence a tourist's experience because of the potential impact this could have on the local economy.

In order to capture the total economic value of a good or service, the consumptive and nonconsumptive use values in addition to nonuse values need to be taken into account. The consumptive use value is the value associated with consuming the good or service and can be revealed through market prices. Nonconsumptive use values are the values associated with personally experiencing the good or service (nonconsumptive use value) without using it up (e.g. hiking, views, and swimming). Nonuse values are not

derived from person experience with the good or service in question. Rather, knowing the good exists (existence value), having the option to access the future (option value) and having the good or service available for future generations (bequest value) are expressions of nonuse value. While use values can be reflected in the market, there is not an efficient market for goods that possess nonconsumptive use or nonuse values, therefore alternative valuation techniques need to be utilized. In order to capture nonconsumptive use and nonuse values, indirect valuation methods (e.g. hedonic property method or travel cost method) or nonmarket valuation methods (e.g. contingent valuation method or contingent behavior method) should be employed (Loomis and Walsh, 1997). This study attempts to capture a portion of the total economic value, the nonconsumptive use value, attributed to scenic landscapes.

There is growing recognition that protecting natural areas, enhancing tourism opportunities or providing recreational settings are actions tightly entwined with quality of life goals that are distinct from, and often in conflict with, economic development goals (McCool and Patterson, 2000). Hence, not capturing the nonconsumptive use values associated with tourism underestimates the impacts local natural attributes have on the local economy which could lead to significantly different policy decisions. In the realm of economics, one area that remains relatively unexplored is the conceptual basis for provision of amenities and their role in development (Marcouiller and Clendenning, 2005). The purpose of this research is to discover tourists' nonconsumptive use values associated with several forms of proposed development both domestically and internationally. Specifically, this research will examine tourists' preferences, trip

3

behavior, trip expenditures, nonmarket values and basic demographics in three applications.

1.2: General Objectives

The general scope of this research is to determine the economic impacts on tourists' nonconsumptive use values in different development scenarios. Specifically, the goal of this research is to meet the following five objectives:

1. Clarify the type of tourist that travels to each destination in this study. Uncover where the tourists travel from, what their spending potential is and the mode that they use for traveling. The goal of this objective is to reveal the demographic profile of the visitors to the areas used in this research.

2. Establish why tourists chose their travel destinations and what specific attributes attracted them to the area. The objective is to unveil the tourist's preferences associated with their travel destination's features.

3. Evaluate the travel behavior of the visitors. Specifically, the goal is to determine the tourists distance and time they spent traveling, the length of time they plan on staying and the activities they plan on participating in while at their destination.

4. Calculate tourists' expenditures while on vacation. Particularly, how much money the respondent spends while on vacation, where they spend their money and what types of goods and services they purchase.

4

5. Estimate tourists' values and behavior contingent on changes in the quality

of the public good attributes of the tourism experience. If the travel

destination were to undergo additional development (for example, in the

form of visitor centers, electrical lines or golf courses) in place of the

current relatively undeveloped state, how might tourists alter their current

travel plans? Specifically, the goal is to assess the anticipated changes in

the tourists' trip length and stay, expenditure patterns and nonconsumptive

use value of the area. In addition, the objective is to determine whether

two different nonmarket valuation techniques (contingent behavior and

contingent valuation) provide statistically different results.

The five main objectives will be investigated for each of the three applications in this

study: tourism infrastructure development within a National Park in Bolivia (Chapter 2),

public transportation and communication infrastructure development along a scenic

roadway to a National Park in Patagonia, Argentina (Chapter 3) and urban development

of ranch open space in Routt County, Colorado (Chapter 4). A fifth chapter summarizes

the findings in terms of cross-cutting themes and discusses directions for future research.

1.3: General Hypotheses

In general, it is hypothesized that people with higher incomes, who travel greater

distances, are more educated, are older and travel independently will spend more money

in the local economy surrounding their travel destination. It is hypothesized that these

people will place a higher value on the nonmarket good in question. Across the three

locations characterized by potentially unique and highly valued natural features, this

5

research examines different valuation techniques in order to determine tourists' values on various forms of development associated with their travel experience. In addition, other factors impacting a tourists' travel behavior, travel expenditures and willingness to pay will be evaluated.

For the natural reserve in Bolivia, a comparative analysis will be conducted between contingent valuation and contingent behavior valuation techniques. The null hypothesis is that survey responses are independent of whether the contingent valuation or contingent behavior technique is utilized as a nonmarket valuation technique.

In regard to the roadway in Argentina, this research will examine three statistically independent hypotheses. First, the analysis of whether statistical differences exist due to different survey elicitation languages (Argentine Spanish versus English) will be investigated. The null hypothesis is that the survey responses and willingness to pay values are independent of the survey elicitation language. Secondly, whether tourists travel through a tour package influences survey responses will be evaluated. It is hypothesized that the inclusion of a tour package will lead to differences in survey responses. Further, whether there is a statistical difference between responses to contingent valuation and contingent behavior techniques will be assessed. This research is an extension of the Bolivia application because it will also incorporate information regarding the tourists' travel expenditures into the valuation estimations. Lastly, the use of pictures of varying levels of development associated with the tourists' trip destination will be used in order to determine whether varying levels of development produce statistically different willingness to pay values and predicted travel behavior. The null

6

hypothesis is that the willingness to pay and predicted travel behavior do not vary with respect to the distinct development scenarios.

The final application regarding preservation or conversion of ranch open space in Routt County, Colorado will evaluate three hypotheses. The first null hypothesis is that tourists' willingness to pay values over time are not statistically different. The second null hypothesis is an extension of the research conducted in Bolivia and Argentina; it is hypothesized that visitors' survey responses are statistically independent of the valuation technique employed. The analysis in the Bolivia application compares responses between the contingent valuation and the contingent behavior methods, while the Routt County application will extend this and incorporate travel cost data, similar to the Argentina application. The Routt County research is a further extension in so far that it evaluates how the results will impact the regional economy. The final null hypothesis states that converting land use from low intensity agriculture to higher intensity homes, recreation or tourism infrastructure will have no impact on the tourism industry or the local economy in Routt County, Colorado.

1.4: Theoretical Grounding

Tourists travel to their destination for reasons such as the activities and the scenic viewscape the area provides. This research examines how more intensive infrastructural or commercial development in currently undeveloped and ecologically unique regions impact tourists' values and behaviors associated with their vacation.

7

1.4.1: Consumer Theory and Welfare Measures

Tourists are considered consumers of tourism goods and services, usually in the form of activities. The theoretical concept of the valuation of nonmarket goods is based on three assumptions of consumer theory. The first assumption states that consumers have well defined preferences among alternative consumption bundles consisting of both market and nonmarket goods. Secondly, it is assumed that the consumers know their preferences. The third assumption states that the consumers' preferences possess the property of substitutability among the market and nonmarket goods within their consumption bundles. Substitutability is defined that if the quantity of one good in an individual's consumption bundle is reduced, it is possible to increase the quantity of another good so that the individual's welfare is no worse off than prior to the change in goods. Substitutability is the core concept of economic value because it establishes trade-off ratios between pairs of goods that matter to the consumer (Freedman III, 2003).

Consumers have a set of possible consumption alternatives which comprise their consumption (or choice) sets (Varian, 1992). The consumption set is a set of all alternatives, known as consumption bundles that the consumer can consume. It is assumed that the consumer identifies and chooses an available alternative that is most preferred in the light of his or her personal tastes, referred to as preferences (Jehle and Reny, 2001). The consumer's preferences are what place an order or rank on the set of consumption bundles. Therefore, assumptions need to be laid out for consumer's preferences that meet certain properties (Varian, 1992).

There are five assumptions concerning consumer's ordering of their consumption bundles based on their preferences. The five assumptions are completeness, transitivity,

8

continuity, strict monotonicity and strict convexity (Varian, 1992; Jehle and Reny, 2001).

The first assumption, completeness, states that the consumer has the ability and necessary

information to discriminate and evaluate alternative consumption bundles. Transitivity

requires that the consumer's choices among consumption bundles be consistent (Jehle

and Reny, 2001). Specifically, if a consumer prefers bundle X_1 to bundle X_2 and also

prefers bundle X_2 to bundle X_3, then it is assumed that the consumer prefers bundle X_1 to

bundle X_3 (Varian, 1992). The third assumption, continuity, is necessary to rule out

certain discontinuous consumer behavior. It states that if a sequence of consumption

bundles (Y^N) is at least as good as bundle X and if the sequence of bundles, Y^N, converge

to bundle Y, then Y is also as least as good as bundle X (Varian, 1992; Jehle and Reny,

2001). Strict monotonicity states that if one consumption bundle (X_1) contains at least as

much of every good as another bundle (X_2), then the former bundle (X_1) is as least as

good as the other (X_2) (Jehle and Reny, 2001). The final assumption about consumer

preferences, strict convexity, requires the rate at which the consumer would trade one

good for another should be strictly diminishing (Jehle and Reny, 2001). If a consumer's

preferences meet these five assumptions, it is assumed that a corresponding utility

function exists (Varian, 1992).

A consumer's utility measures his or her overall satisfaction derived from

consumption and is the basis of the ranking of a consumer's preferences, ceteris paribus

(Nicholson, 2002). Therefore, the consumer's problem is to maximize his or her utility

given his or her budget constraint, expressed as follows:

Max **u(x)**
Such that: **px ≤ m**

9

Where **u(x)** is the consumer's utility as a function of the consumer's choice set; **px** is the consumer's expenditure, where **p** is the price of the good multiplied by **x**, the quantity of goods consumed; and **m** is the consumer's income level (Varian, 1992).

The indirect utility function is derived from the utility maximization problem. The indirect utility function gives the maximum utility possible, given prices and income. The desired bundle that solves this problem is known as the demanded bundle. It is assumed that at each of the consumer's budget levels there is a corresponding demand bundle (Varian, 1992).

The function that relates prices and income is the consumer's demand function (Varian, 1992). Freeman III (2003) states that value estimation involves determining indirectly the shapes of the demand or marginal willingness to pay curves for the good. When consumer's income and all prices other than the good's own price and consumer's utility are held fixed, the consumer's demand of a good is known as Marshallian (or uncompensated) demand (Varian, 1992). The Marshallian demand curve is also referred to as the uncompensated demand curve because it is not adjusted for implicit changes in income due to a change in the price of a good (Nicholson, 2002). The other form of demand is known as Hicksian (or compensated) demand. Hicksian demand holds all other goods' prices and the consumer's utility constant, while allowing the good's own price and the consumer's income to fluctuate (Nicholson, 2002). The Hicksian demand is referred to as compensated demand because it is assumed by allowing income to change, it is arranged to "compensate" the consumer for a price change in order to maintain their original utility level (Varian, 1992).

10

The economic value of changes in a resource system, such as potential development within a scenic viewscape, is the effect of the changes on human welfare. There are five alternative welfare measures that potentially could be used in indirectly measuring the economic value of a nonmarket good. The five welfare measures are based on the two forms of demand curves, the Hicksian demand curve and the Marshallian demand curve (Freeman III, 2003).

The first welfare measure, consumer's surplus, is measured by the area under the Marshallian (uncompensated) demand curve and above the price line as seen as the shaded area in Figure 1.1. However, the consumer's surplus welfare measure cannot be defined in terms of the consumer's utility function, therefore should not be used, ideally. The other four welfare measures stem from the theory underlying the consumer's surplus and originate from the Hicksian (compensated) demand curve. There are two forms of Hicksian welfare measures, the surplus measures and the variation measures which are displayed in Figure 1.2 with a price increase (from P^0 to P^1) for a good which leads to a welfare loss (from U^0 to U^1) (Freeman III, 2003).

11

Figure 1.1: Marshallian Demand and Consumer Surplus
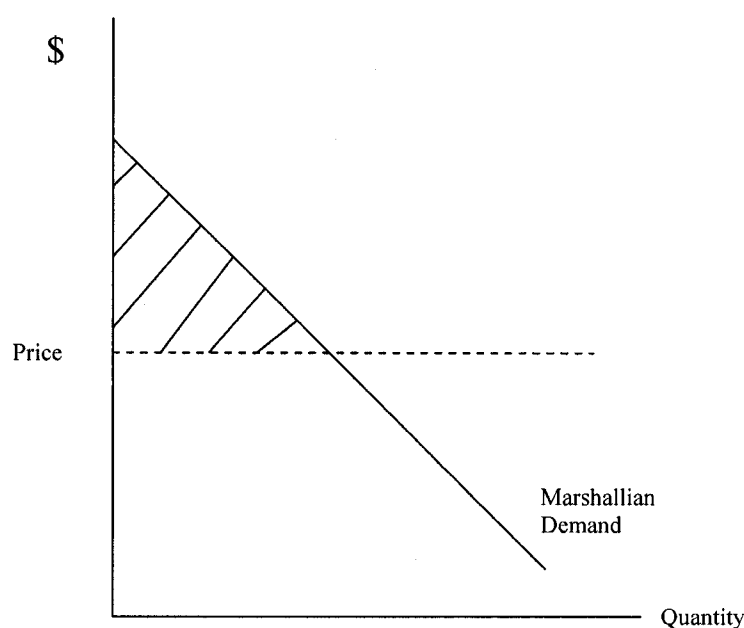
The surplus measures do not allow the individual to optimally adjust his or her

consumption bundles when there is a change in prices (Brookshire *et al.*, 1980;

Rosenberger, 1996). The compensating surplus measure is a compensating payment that

will make the individual indifferent as to the original situation and the opportunity to

purchase the new quantity of the good whose price has changed (Freeman III, 2003;

Seller *et al.*, 1985). For a price increase, it is the amount of compensation the individual

is willing to accept for a less preferred situation which is displayed as the vertical

distance between the two indifference curves at the new consumption bundle, X^1

(Freeman III, 2003; Seller *et al.*, 1985; Zerbe and Dively, 1994). This is the distance

between point E and point B in Figure 1.2. The equivalent surplus measure is the change

in income required, given the old prices and old consumption level of the good, to make

the individual as well off as he or she would be with the new price set and new

12

consumption level (Freeman III, 2003; Seller *et al.,* 1985). For a price increase, it is the amount the individual is willing to pay to avoid a less preferred situation which is displayed as the vertical distance between the two indifference curves at the original consumption bundle, X^0 (Freeman III, 2003; Seller *et al.,* 1985; Zerbe and Dively, 1994). This is the distance between point A and point F in Figure 1.2. For a price increase, the compensating surplus is greater than the equivalent surplus (Freeman III, 2003).

Unlike, the Hicksian surplus measures, the Hicksian variation measures allow the individual to optimally adjust his or her consumption bundles when there is a change in the price of the good being valued (Brookshire *et al.,* 1980; Rosenberger, 1996). The compensating variation measure is a compensating payment necessary to make the individual indifferent between the original situation and the new price set (Freeman III, 2003; Seller *et al.,* 1985). For a price increase, it is the amount of compensation the individual is willing to accept for a less preferred situation which is displayed as the vertical distance between the two indifference curves based on the original price level shown on the vertical axis (Freeman III, 2003; Seller *et al.,* 1985; Zerbe and Dively, 1994). The compensating variation measure is the change from the original consumption bundle, point A, to a consumption bundle with the same utility level and a new price level, shown as point D in Figure 1.2 (Freeman III, 2003; Rosenberger, 1996; Zerbe and Dively, 1994). The equivalent variation measure is the change in income, given the original prices that would lead to the same utility change as the change in the price of the good (Freeman III, 2003; Seller *et al.,* 1985). For a price increase, it is the amount the individual is willing to pay to avoid a less preferred situation which is displayed as the vertical distance between the two indifference curves based on the new price level shown

13

on the vertical axis (Freeman III, 2003; Seller *et al.,* 1985; Zerbe and Dively, 1994). The

equivalent variation measure is the change from the original consumption bundle, point

A, to a consumption bundle with a new utility level and the original price level, shown as

point C in Figure 1.2 (Freeman III, 2003; Rosenberger, 1996; Zerbe and Dively, 1994).

For a price increase, the compensating variation is greater than the equivalent variation

(Freeman III, 2003).

Figure 1.2: Hicksian Demand: Surplus and Variation Measures for a Price Increase
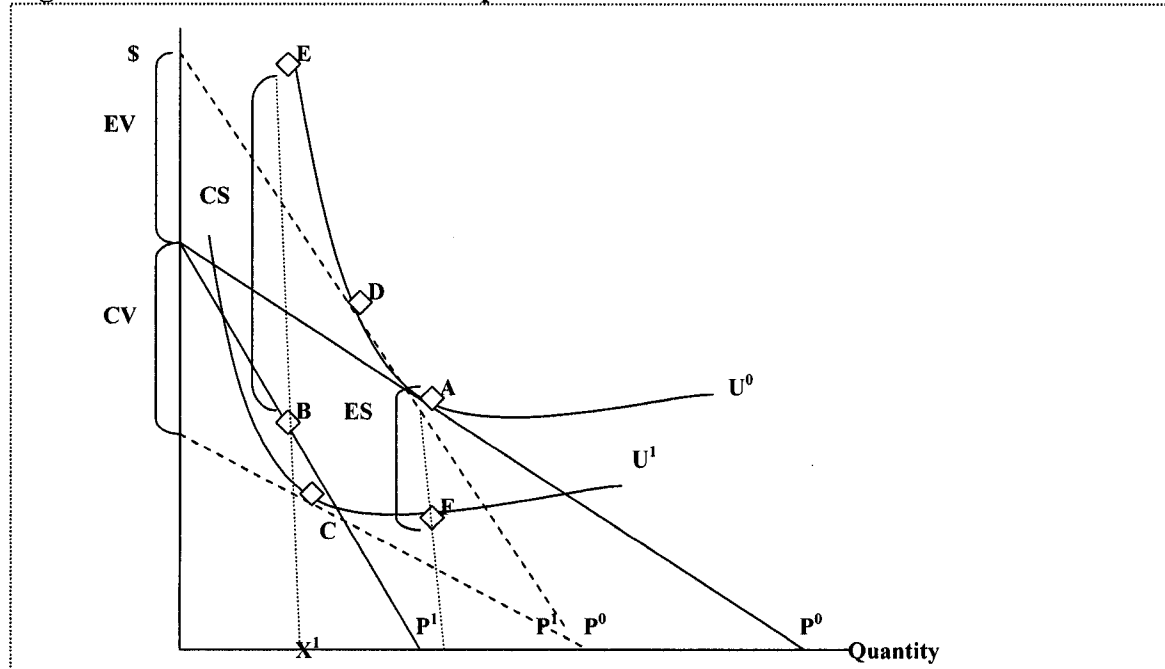
Since the surplus measures do not permit an individual to adjust his or her

consumption bundles with a price change, Brookshire *et al.* (1980) states that the

variation measures should be used when adjustments are possible. The compensating

variation and equivalent variation measures represent welfare-relevant measures. The

equivalent variation measure is an ordinal utility index or the monetary equivalent of a

price change, while the compensating variation measure cannot be measured as an index

14

of utility. Rather, compensating variation measures the offsetting income change necessary to "prevent" a utility change (Freeman III, 2003).

This research evaluates the consumer's willingness to pay to protect different kinds of relatively natural landscapes. Or, put another way, the consumer's willingness to pay to avoid a less preferred (more intensively developed landscape) situation relative to the original more natural landscape. Therefore, the theoretically correct welfare measure for this study is the equivalent variation measure (Brookshire *et al.,* 1980; Rosenberger 1996; Seller *et. al,* 1985). However, the Hicksian welfare measures are empirically unobservable, while the Marshallian welfare measure of consumer surplus is empirically observable (Freeman III, 2003; Nicholson, 2002; Willig, 1976). Willig (1976) states that the observable consumer's surplus can be utilized to approximate the unobservable compensating and equivalent variation welfare measures. Further, Willig's (1976) results imply that the error of approximation is very small so much so that consumer's surplus is usually a very good approximation to the appropriate welfare measures. Therefore, this research will empirically estimate consumer's surplus since the appropriate theoretical measure of equivalent variation is unobservable for valuing a good where a market does not exist, such as a public good.

1.4.2: Public Goods

Local public good uses of undeveloped lands include aesthetic (scenic) benefits for traveling residents and visitors. Markets undersupply public goods because once a public good is produced, no one can be excluded from benefiting from its availability and the marginal cost of an additional consumer benefiting from it must be equal to zero

15

(Loomis, *et al.,* 2006; Nicholson, 2002; Varian, 1992). The two conditions that must be met in order for a good to be classified as a public good are non-exclusivity and non-rivalry. Non-exclusivity exists when it is either impossible or very expensive to exclude individuals from benefiting from the good which leads to the free rider problem. The free rider problem occurs when consumers do not pay for access or use of the good (Varian, 1992). Due to the free rider problem, private firms are not willing to provide goods that are non-exclusive (Nicholson, 2002; Varian, 1992). Scenic viewscapes are non-exclusive because it is near impossible to prevent people from viewing a landscape. For example, one cannot prevent a person from looking out their window whether it is from their house or their car. The second condition, non-rivalry, occurs when the consumption of additional units of the good results in marginal costs of production equal to zero. Non-rivalry makes it inefficient to charge people for consuming the good (Nicholson, 2002; Varian, 1992). Scenic viewscapes are non-rival since the cost for an additional consumer to view the landscape is zero. It is impossible to prevent someone from looking out their window and it is even more implausible to attempt to charge a person a price to view the landscape. Public goods result in a market failure due to non-rivalry and nonexclusivity. Therefore, an efficient market for public goods does not exist and market prices cannot be used to derive their economic value. As a result, public goods are classified as nonmarket goods (Nicholson, 2002; Varian, 1992).

Although market prices of land do not reflect public good values, the willingness to pay principle on which market prices are based still applies (Loomis *et al.,* 2006). In the case of nonmarket goods, when prices are not available, the trade-off ratios can be interpreted as expressions of economic values. The trade-off ratios can be defined in

16

terms of any good, including money, which the individual is willing to substitute for the good that is being valued. Therefore, the individual's willingness to pay for an additional unit of output can be used to express the marginal economic value of the nonmarket good (Freeman III, 2003).

The total demand for the public good is derived by the sum all of the consumers' values of that extra output, since all consumers will benefit (Nicholson, 2002). With a private good, the market demand is a horizontal summation of each individual's demand curve, because the additional unit produced will be consumed by the next individual who values the private good. However, with public goods, an increase in the good is not limited to one additional consumer since all consumers will benefit. Therefore, the total demand of a public good is the vertical summation of each individual's demand curve because all consumers will benefit from an increase in an additional unit of a public good (Nicholson, 2002). Specifically, for the case of goods that are directly experienced, but can neither be consumed nor possessed, the appropriate measure of value is known as a nonconsumptive use value. Nonconsumptive use values are attributed to values associated with using a resource without actually consuming that resource, such as viewing a scenic landscape.

1.4.3: Stated Preference Methods

In order to derive the economic value of public goods, a nonmarket valuation method needs to be employed (Freeman III, 2003). There are two forms of valuation of nonmarket goods and services, the stated preference methods and the revealed preference methods. Revealed preference methods draw statistical inferences on values from actual

17

choices people make within markets (Boyle, 2003b). The stated preference methods attempt to induce individuals to reveal their preferences through their behavior in hypothetical markets (McConnell and Walls, 2005). Shultz *et al.* (1998) states that in order to remain consistent with consumer choice theory, the elicitation of willingness to pay needs to propose hypothetical or contingent changes to the tourism product being valued. Stated preference methods are survey based approaches that rely on answers to carefully worded nonmarket valuation questions (Brown, 2003; Loomis, *et al.*, 2006). Stated preferences have been used for more than 40 years; during this time, over 2,000 studies have been conducted in regards to real world problems ranging from water quality, wilderness preservation, health care and food safety (Carson, 2000; Stevens, 2005). This research uses stated preference methods, specifically the contingent valuation and the contingent behavior methods, to estimate the public good in question; scenic landscapes.

The contingent valuation method is facilitated by positing behavioral changes due to different values contingent on the provision of a change to the good under question. It is a direct interview (i.e. survey) approach that can be used to provide acceptable measures of the economic value of recreation opportunities as well as the preservation of natural resources (Lindberg, 2003; Loomis and Walsh, 1997). The objective of the contingent valuation method is to measure consumer surplus for the environmental attributes of a tourism product. The contingent valuation method is based on two assumptions. The first assumption is that the respondent has well-defined preferences for the natural resource being valued relative to other resources he or she could purchase.

18

The second assumption is that the nonmarket value can accurately be elicited from the respondent via a survey or interview (Loomis, 2002a).

While the contingent valuation method elicits a value statement for a nonmarket good, contingent behavior is used to estimate changes in behavior for a nonmarket good. The contingent behavior method asks respondents about their intended visitation behavior given a proposed change to the good (Chase *et al.*, 1998). Specifically, the contingent behavior method is used to measure the current number of trips or days the respondent plans to spend at their desired tourist location and provides the respondents an option to change the number of trips or the number of days on a given trip with hypothetical changes to the area (Lindberg, 2003).

Stated preference methods are commonly criticized because of the hypothetical nature of the questions and the fact that actual behavior is not observed (Cummings *et al.*, 1986; Loureiro *et al.*, 2003; Mitchell and Carson, 1989). However, Manski (2000) states that in order to address the important issues surrounding stated preference controversy the stated preference methods must be refined. Herath (2002) contends that diversity in contingent valuation applications is required to suit different circumstances, particularly in the case of valuing viewscapes. Adamowicz *et al.* (1994) argue that the strength of the contingent valuation method as a natural resource valuation tool is improved, if it is implemented in combination with another nonmarket valuation technique. Here, we explore this contention by including both contingent valuation and contingent behavior estimates in our modeling efforts.

Further, this research will compare the results between these two stated preference methods, testing convergent validity. Convergent validity investigates consistency of

contingent valuation estimates by comparing contingent valuation estimates for a particular good with estimates for the same good provided by an alternative nonmarket valuation method, in this case contingent behavior (Boyle, 2003a; Santos, 1998). The contingent valuation model can be jointly estimated with recreation demand (i.e. via the contingent behavior method) to test for convergent validity (Cameron 1992a; Cameron 1992b; Cameron and Englin, 1991; Whitehead, 1995).

Another way to expand the stated preference modeling is to incorporate revealed preference data into the estimations. Bhat and Sardesai (2006), Cameron (1992a), Espino *et al.* (2006), Loomis (2002b), and Loomis (1997) also incorporate revealed preference data into the stated preference analysis for the valuation of various natural resources related to tourism. Grijalva *et al.* (2002) find that methods of augmenting revealed preference data with stated preference data show promise as a tool for estimating demand for a choice-based sample. In addition, Louviere *et al.* (2000) state that models combining revealed preference and stated preference data exploit the advantages and overcome the limitations of each type of data. Further, Louviere *et al.* (2000) state that attributes from choices in actual markets (e.g. revealed preferences) often cannot predict the impact of changing policy attributes (e.g. prices) which is where the inclusion of stated preference data strengthens the revealed data. The latter two case studies of this research are going to extend these studies by incorporating revealed preference data into the stated preference analysis. This research will combat the issues surrounding stated preference valuation techniques by incorporating revealed preference data, specifically travel cost information, into the comparison of the two stated preference methods, contingent behavior and contingent valuation.

20

1.5: Empirical Approach

In order to capture the tourists' attitudes, travel behaviors and values towards development in the three applications, intercept surveys were administered in each of the three cases. The tourist was approached by a member of the research team who asked several filter questions in order to establish willingness and eligibility to complete on site the questionnaire. If the tourist was deemed qualified as a potential respondent after the preliminary questions, he or she was provided a survey to complete themselves, which took, on average, 10 to 20 minutes to complete. The surveys included, generally, questions regarding the respondents' reason for visiting the specified area, their trip characteristics, their trip expenditures and their nonmarket values and behavior contingent on potential development. In addition, general demographic questions were asked in order to gain a better understanding of the tourists and to facilitate modeling based on the standard assumptions of economic theory.

The visitor's values and behaviors contingent on land use change were derived from two forms of nonmarket valuation techniques. The techniques employed in this research were the contingent valuation method and the contingent behavior method. In the latter two applications, travel cost data are incorporated into the analysis. In addition, the final application expanded the research to encompass the resulting impacts to the broader local economy. Across the three applications each of the valuation techniques were asked in different question formats. With each question format, there is a corresponding econometric modeling technique or techniques that need to be employed.

21

Across the three applications, this research employs four different elicitation methods: dichotomous choice, open-ended payment card, trichotomous choice and open ended valuation questions, in order to capture the contingent behavior and contingent valuation estimates. Further, the final study provides the opportunity to combine the trichotomous choice and open ended elicitation questions.

Many studies have been conducted utilizing the dichotomous choice elicitation method for nonmarket valuation techniques (e.g., Boyle and Bishop (1988), Garcia and Riera (2003), Grijalva et al. (2002), Lee and Han (2002), Leon (1997), Mathieu et al. (2003), Ready et al. (2001) and Shultz et al. (1998)). Primarily, the dichotomous choice results were evaluated via the binary logit model (Boyle and Bishop, 1988; Lee and Han, 2002; Leon, 1997; Mathieu et al., 2003; Shultz et al., 1998). Alternative estimation methods were also used in addition to the logit model estimation method. For example, Garcia and Riera (2003) used the extended spike model and Grijalva et al. (2002) used the binomial Poisson regression while also estimating their results with the logit model. However, Ready et al. (2001) used the Turnbull estimation method for estimating their binary choice elicitation question. Due to the popularity and success of the logit model for binary choice estimation in previous research studies, this research will also utilize the logit model to evaluate the dichotomous choice estimates (Greene, 2003).

The payment card question format can either be close-ended or open-ended. For estimating close-ended payment card results, the ordinary least squares regression is commonly used (e.g., Bergstrom et al., 1985; Blaine et al., 2003; Bowker and Didychuck, 1994; Mathieu et al., 2003). However, the payment card format employed in this research is open-ended, which provides a variety of estimation alternatives. Fredman

22

and Emmelin (2001), Jim and Chen (2006) and Rosenberger and Walsh (1997) employ the open-ended payment card in their analyses and each estimates their results differently. Fredman and Emmelin (2001) calculate the expected probability of undertaking the trip for different values, while Jim and Chen (2006) develop an ordered probit modeling technique. Rosenberger and Walsh (1997) estimate their open-ended payment card results with the ordinary least squares regression. However, Boyle (2003a) states that the single-bounded Tobit model is the appropriate estimation tool since highly positive outliers may exist, which will be utilized in this research.

The final two elicitation methods in this research, the trichotomous choice and open ended valuation questions will be combined to represent one question. Therefore, the responses will be both positive and negative. In order to capture the contingent valuation or contingent behavior values, Grijalva et al. (2002), Leon (1997), and Willis and Garrod (1993) utilized the open ended valuation question. Grijalva et al. (2002) evaluated their results with a seemingly unrelated Poisson regression, while Willis and Garrod (1993) used the ordinary least squares regression. However, Leon (1997) used both the single bounded and double bounded Tobit econometric techniques to value the open ended valuation estimates. In addition, Greene (2003) states that the Poisson count data model would be an appropriate measure, while Boyle (2003a) claims that a single bounded Tobit model can be employed to econometrically evaluate the open ended responses. By combining both questions and allowing for positive and negative values, the ordinary least squares regression will be utilized for these elicitation methods (Greene, 2003).

23

The hypotheses will be analyzed using various statistical tests that stem from these econometric models. Regardless of the nonmarket good in question, any of these valuation techniques with the various question formats can be utilized to derive the contingent values or behaviors of the tourists in relation to the potential development at their travel destination.

1.6: Individual Applications

1.6.1: Eduardo Avaroa Reserve, Bolivia

Nestled in the southwest corner of Bolivia, the Eduardo Avaroa Reserve or Reserva Eduardo Avaroa (REA) is a Priority I ecoregion due to its unique ecological and archeological features. The reserve has an arid landscape, which consists of volcanoes, geysers, salt marshes and mountain lakes. Eduardo Avaroa Reserve spans an area of 1.8 million acres and has more than 50 archeological sites making it rich in cultural and archeological heritage. REA houses at least 190 species of plants and trees and 80 different species of birds including three of the world's six flamingo species. It is one of the most visited reserves in Bolivia and also one of the most economically depressed regions in the country with ecological threats to the region consisting of mining, poor farming practices and unregulated tourism. While tourism can serve as an income-generating activity for the region, uncontrolled tourism that is developed without consideration of the environmental and cultural impacts can adversely affect the natural areas. In order to avoid the potential negative impacts, a proposed fee increase is examined in order to improve the reserve's management (The Nature Conservancy, undated).

24

1.6.2: Scenic Roadway, Argentina

El Calafate is the gateway community to Glaciers National Park, a UNESCO World Heritage site, located 80 km to the West of town along Provincial Highway #11. Glaciers National Park has experienced a remarkable increase in visitation in recent years and due to the popularity of the Park and the unique natural environment of the region, development along the highway is an important planning decision for local leaders. Provincial Highway #11 between El Calafate and Glaciers National Park (Appendix IIIA: Map of Argentina) currently offers an open view of the snow-capped mountains, traditional wildlife, farms and ranches and the rugged Patagonian landscape. Currently, there are no electric lines, billboards, or other infrastructural development along the route, other than the paved two lane roadway. El Calafate provides most of the tourist services for Glaciers National Park, including the nearest commercial airport, restaurants, hotels, grocery stores and other services, while a few lodges exist very close to the Park's entrance. In order to improve local economic development decision making, visitors were asked to assess the value of the open landscape to their tourism experience relative to a view including more infrastructure development, their willingness to pay to avoid such development and the likely impact of such development on their travel plans.

1.6.3: Routt County, Colorado

Steamboat Springs, the county seat of Routt County, Colorado is a unique community and tourist destination, possessing a distinctive Rocky Mountain landscape, plentiful outdoor recreation, culinary and cultural opportunities and a long tradition of the

25

"Old West." Cattle ranching and its related industries has long been a central feature of Routt County's private land use and community culture. In recognition of the contribution of working landscapes to the well being of the community, Routt County implemented a voluntary purchase of development rights program in order to help to preserve this traditional lifestyle in the county's vast valleys in 1995. In order to establish whether public funds had been well invested and to gauge the continued need to maintain or expand the existing open lands preservation policy, visitors were asked to evaluate the extent to which the attributes of open landscapes contributed to their tourism experience and what they would be willing to pay to maintain or enhance those features.

The next three chapters will compare the contingent valuation results with contingent behavior results in valuing: improvements to the Eduardo Avaroa Reserve in Bolivia (Chapter 2), a relatively undeveloped landscape along a roadway from El Calafate to Glaciers National Park in the Patagonia region of Argentina (Chapter 3), and ranchland open space in Routt County, Colorado (Chapter 4). The final chapter will summarize and conclude the results of the three applications to tourists' values associated with land use changes.

26

REFERENCES

Adamowicz, Wiktor L, J. Louviere, and M. Williams. May 1994. "Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities." *Journal of Environmental Economics and Management*, 26(3): 271-92.

Bennett, D.Gordon. 1996. "Implication of Retirement Development in High-Amenity Nonmetropolitan Coastal Areas." *Journal of Applied Gerontology*, 15: 345-360.

Bergstrom, John C., B. L. Dillman and John R. Stoll. July 1985. "Public Environmental Amenity Benefits of Private Land: The Case of Prime Agricultural Land." *Southern Journal of Agricultural Economics*, 17(1): 139-149.

Bhat, Chandra R. and Rupali Sardesai. 2006. "The Impact of Stop-Making and Travel Time Reliability on Commute Mode Choice." *Transportation Research Part B*, 40: 709-730.

Blaine, Thomas W., Frank R. Lichtkoppler and Reed Stanbro. August 2003. "An Assessment of Residents' Willingness to Pay for Green Space and Farmland Preservation Conservation Easements Using the Contingent Valuation Method." *Journal of Extension*, 41(4): 18 pgs.

Bowker, J.M. and D.D. Didychuk. 1994. "Estimation of the Non-market Benefits of Agricultural Land Retention in Eastern Canada." *Agricultural and Resource Economics Review* 23(2): 218–55.

Boyle, Kevin J. 2003a. "Contingent Valuation in Practice." In Patricia Champ, Kevin Boyle and Thomas Brown (Eds.), *A Primer on Nonmarket Valuation* (pp.111-169). Norwell, MA: Kluwer Academic Publishers.

Boyle, Kevin J. 2003b. "Introduction to Revealed Preference Methods." In Patricia Champ, Kevin Boyle and Thomas Brown (Eds.), *A Primer on Nonmarket Valuation* (pp.259-267). Norwell, MA: Kluwer Academic Publishers.

Boyle, Kevin J. and Richard C. Bishop. February 1988. "Welfare Measurements Using Contingent Valuation: A Comparison of Techniques." *American Journal of Agricultural Economics*, p. 20-28.

Brookshire, David S., Alan Randall and John R. Stoll. August 1980. "Valuing Increments and Decrements in Natural Resource Service Flows." *American Journal of Agricultural Economics*, 62: 478-488.

27

Brown, Thomas C. 2003. "Introduction to Stated Preference Methods." In Patricia Champ, Kevin Boyle and Thomas Brown (Eds.), *A Primer on Nonmarket Valuation* (pp.99-110). Norwell, MA: Kluwer Academic Publishers.

Cameron, Trudy Ann. August 1992a. "Combining Contingent Valuation and Travel Cost Data for the Valuation of Nonmarket Goods." *Land Economics,* 68(3): 302-317.

Cameron, Trudy Ann. December 1992b. "Nonuser Resource Values." *American Journal of Agricultural Economics,* 74: 1133-1137.

Cameron, Trudy Ann and Jeffrey Englin. 1991. "Cost-Benefit Analysis for Non-Market Resources: A Utility-Theoretic Empirical Model Incorporating Demand Uncertainty." Western Regional Research Project W-133, Benefits and Costs in Natural Resources Planning, Fourth Interim Report.

Carson, Richard T. 2000. "Contingent Valuation: A User's Guide." *Environmental Science and Technology,* 38(4): 1413-1418.

Chase, Lisa C., David R. Lee, William D. Schulze, and Deborah J. Anderson. November 1998. "Ecotourism Demand and Differential Pricing of National Park Access in Costa Rica." *Land Economics,* 74(4): 466-82.

Cummings, R.G., David S. Brookshire and William D. Schulze, Eds. 1986. *Valuing Environmental Goods: A State of the Arts Assessment of the Contingent Method.* Totowa, NJ: Rowman and Allanheld.

Espino, Raquel, Concepcion Roman and Juan De Dios Ortuzar. 2006. "Analysing Demand for Suburban Trips: A Mixed RP/SP Model with Latent Variables and Interaction Effects." *Transportation,* 33: 241-261.

Fredman, Peter and Lars Emmelin. 2001. "Wilderness Purism, Willingness to Pay and Management Preferences: A Study of Swedish Mountain Tourists." *Tourism Economics,* 7(1): 5-20.

Frederick, Martha. 1993. "Rural Tourism and Economic Development." *Economic Development Quarterly,* 7: 215-224.

Freeman III, A. Myrick 2003. *The Measurement of Environmental and Resource Values.* 2nd ed. Washington, D.C.: Resources for the Future.

Garcia, Dolores and Pere Riera. September 2003. "Expansion versus Density in Barcelona: A Valuation Exercise." *Urban Studies,* 40(10): 1925-1936.

Greene, William H. 2003. *Econometric Analysis.* 5th ed. Upper Saddle River, NJ: Prentice Hall.

Grijalva, Therese C., Robert P. Berrens, Alok K. Bohara, and W. Douglass Shaw. May 2002. "Testing the Validity of Contingent Behavior Trip Responses." *American Journal of Agricultural Economics*, 84(2): 401-14.

Herath, Gamini. 2002. "Research Methodologies for Planning Ecotourism and Nature Conservation." *Tourism Economics*, 8(1): 77-101.

Jakus, Paul Mark, Paul B. Siegel and Richard L. White. Fall 1995. "Tourism as Rural Development Strategy: Finding Consensus in Residents' Attitudes." *Tennessee Agricultural Science*, 22-29.

Jehle, Geoffrey A. and Philip J. Reny. 2001. *Advanced Microeconomic Theory.* 2nd ed. New York, NY: Addison Wesley.

Jim, C.Y. and Wendy Y. Chen. 2006. "Recreation-Amenity Use and Contingent Valuation of Urban Greenspaces in Guangzhou, China." *Landscape and Urban Planning,* 75: 81-96.

Keith, John. and Christopher Fawson. 1995. "Economic Development in Rural Utah: Is Wilderness Recreation the Answer?" *Annals of Regional Science,* 29: 303-313.

Keith, John., Christopher Fawson and Tsangyao Chang. 1996. "Recreation as an Economic Development Strategy: Some Evidence from Utah." *Journal of Leisure Research,* 28: 96-107.

Lee, Choong-Ki and Sang-Yoel Han. 2002. "Estimating the Use and Preservation Values of National Parks' Tourism Resources Using a Contingent Valuation Method." *Tourism Management*, 23: 531-40.

Leon, Carmelo J. 1997. "Valuing International Tourism Benefits from Natural Areas." *Tourism Economics*, 3(2): 119-36.

Lindberg, Kreg. 2003. "Introduction to Markets for Nature Tourism: Demand Analyses." In Bruce Aylward and Ernst Lutz (Eds.), *Nature Tourism, Conservation, and Development in Kwazulu-Natal, South Africa* (pp. 41-54). Washington DC: The International Bank for Reconstruction and Development, The World Bank.

Loomis, John B. 2002a. *Integrated Public Lands Management: Principles and Applications to National Forests, Parks, Wildlife Refuges, and BLM Lands.* 2nd ed. New York, NY: Columbia University Press.

Loomis, John. 2002b. "Quantifying Recreation Uses Values from Removing Dams and Restoring Free-Flowing Rivers: A Contingent Behavior Travel Cost Demand Model for the Lower Snake River." *Water Resources Research,* 38(6): 21-28.

29

Loomis, John B. 1997. "Panel Estimators to Combine Revealed and State Preference Dichotomous Choice Data." *Journal of Agricultural and Resource Economics,* 22(2): 233-245.

Loomis, John, Andrew F. Seidl, Kerri L. Rollins and Vicki Rameker. 2006. "Alternative Valuation Strategies for Public Open-Space Purchases: Stated versus Market Evidence." In Robert J. Johnston and Stephen K. Swallow (Eds.), *Economics and Contemporary Land Use Policy* (pp. 183-202). Washington DC: Resources for the Future.

Loomis, John B. and Richard G. Walsh. 1997. *Recreation Economic Decisions: Comparing Benefits and Costs.* 2nd ed. State College, PA: Venture Publishing, Inc.

Loureiro, Maria L., Jill J. McCluskey and Ron C. Mittelhammer. February 2003. "Are Stated Preferences Good Predictors of Market Behavior?" *Land Economics,* 79(1): 44-55.

Louviere, Jordan J., David A. Hensher and Joffre D. Swait. 2000. *Stated Choice Methods: Analysis and Application.* Cambridge MA: Cambridge University Press.

Manski, Charles F. 2000. "Economic Analysis of Social Interactions." *Journal of Economic Perspectives,* 14(3): 115-136.

Marcouiller, David W. 1998. "Environmental Resources as Latent Primary Factors of Production in Tourism: The Case of Forest-Based Commercial Recreation." *Tourism Economics,* 4: 131-145.

Marcouiller, David W. 1997. "Toward Integrative Tourism Planning in Rural America." *Journal of Planning Literature,* 11: 337-357.

Marcouiller, David W. and Greg Clendenning. 2005. "The Supply of Natural Amenities: Moving from Empirical Anecdotes to a Theoretical Basis." In Gary Paul Green, Steven C. Deller and David W. Marcouiller (Eds.), *Amenities and Rural Development: Theory, Methods and Public Policy* (pp. 6-32). Northampton, MA: Edward Elgar Publishing, Inc.

Mathieu, Laurence F., Ian H. Langford and Wendy Kenyon. 2003. "Valuing Marine Parks in a Developing Country: A Case Study of the Seychelles." *Environment and Development Economics,* 8: 373-390.

McConnell, Virginia, and Margaret Walls. January 2005. "The Value of Open Space: Evidence from Studies of Non-Market Benefits." Resources for the Future. Accessed at: http://www.rff.org/rff/Documents/RFF-REPORT-Open%20Spaces.pdf. Accessed on February, 2005.

McCool, Stephen F. and Michael E. Patterson. 2000. "Trends in Recreation, Tourism and Protected Area Planning." In William C. Gartner and David W. Lime (Eds.), *Trends in Outdoor Recreation, Leisure and Tourism* (pp. 111-119). New York: CABI Publishing.

McDonough, M., J. Fried, K. Potter-Witter, J. Stevens and D. Stynes. 1999. "The Role of Natural Resources in Community and Regional Economic Stability in the Eastern Upper Peninsula." Research Report 568, Michigan Agricultural Experiment Station, Michigan State University.

Mitchell, Robert C. and Richard T. Carson. 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method.* Baltimore, MD: Johns Hopkins University Press for Resources for the Future.

The Nature Conservancy. Undated. "Eduardo Avaroa Andean Fauna National Reserve, Bolivia." Fact Sheet.

Nicholson, Walter. 2002. *Microeconomic Theory: Basic Principles and Extensions.* 8th ed. Amherst, MA: South-Western Thomson Learning.

Power, Thomas Michael. 2005. "The Supply and Demand for Natural Amenities: An Overview of Theory and Concepts." In Gary Paul Green, Steven C. Deller and David W. Marcouiller (Eds.), *Amenities and Rural Development: Theory, Methods and Public Policy* (pp. 63-77). Northampton, MA: Edward Elgar Publishing, Inc.

Power, Thomas Michael. 1988. *The Economic Pursuit of Quality,* Armonk, NY: M.E. Sharpe.

Ready, Richard C., Stale Navrud and W. Richard Dubourg. August 2001. "How Do Respondents with Uncertain Willingness to Pay Answer Contingent Valuation Questions?" *Land Economics,* 77(3): 315-326.

Rosenberger, Randall S. Spring 1996. "Economic Value of Ranch Open Space: Efficiency and Equity Implications." Ph.D. Dissertation, Department of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO: 164 pgs.

Rosenberger Randall S. and Richard G. Walsh. 1997. "Nonmarket Value of Western Valley Ranchland Using Contingent Valuation." *Journal of Agricultural and Resource Economics,* 22(2):296-309.

Santos, Jose Manual L. 1998. *The Economic Valuation of Landscape Change: Theory and Policies for Land Use and Conservation.* Northampton, MA: Edward Elgar Publishing Limited.

31

Shultz, Steven, Jorge Pinazzo, and Miguel Cifuentes. 1998. "Opportunities and Limitations of Contingent Valuation Surveys to Determine National Park Entrance Fees: Evidence from Costa Rica." *Environment and Development Economics*, 3:131-49.

Seller, Christine, John R. Stoll and Jean-Paul Chavas. May 1985. "Validation of Empirical Measures of Welfare Change: A Comparison of Nonmarket Techniques." *Land Economics,* 61(2): 156-175.

Stevens, Thomas H. 3rd Quarter, 2005. "Can Stated Preference Valuations Help Improve Environmental Decision Making?" *Choices,* 20(3): 189-193.

Varian, Hal R. 1992. *Microeconomic Analysis.* 3rd ed. New York, NY: W.W. Norton & Company, Inc.

Wall, Geoffrey. 1997. "Sustainable Tourism - Unsustainable Development." In Salah Wahab and John J. Pigram (Eds.), *Tourism Development and Growth: The Challenge of Sustainability* (pp. 33-49). New York: Routledge.

Whitehead, John C. May 1995. "Willingness to Pay for Quality Improvements: Comparative Statics and Interpretation of Contingent Valuation Results." *Land Economics,* 71(2): 207-215.

Willig, Robert D. September 1976. "Consumer's Surplus Without Apology." *The American Economic Review,* 66(4): 589-597.

Willis, Kenneth G. and Guy D. Garrod. 1993. "Valuing Landscape: A Contingent Valuation Approach." *Journal of Environmental Management,* 37:1-22.

Wunder, Sven. 2000. "Ecotourism and Economic Incentives – An Empirical Approach." *Ecological Economics,* 32: 465-79.

Zerbe Jr., Richard O. and Dwight D. Dively. 1994. *Benefit-Cost Analysis: In Theory and Practice.* New York, NY: HarperCollins College Publishers.

CHAPTER 2: EDUARDO AVAROA RESERVE, BOLIVIA
(This study is cited as: Lindsey Ellingson and Andy Seidl. 2007. "Comparative Analysis of Non-Market Valuation Techniques for the Eduardo Avaroa Reserve, Bolivia." *Ecological Economics,* Vol. 60: 517-525.)

2.1: Introduction

2.1.1: Introduction

Tourism is among the world's largest and fastest growing industries. Ecological tourism has been held up as a potentially important development alternative in relatively undeveloped regions and countries (Wall, 1997). In the case of developing countries, a rapidly growing tourism industry has proved to be an increasingly important source of foreign exchange inflows (Wunder, 2000). In fact, the demand for ecotourism flows mainly from the developed countries to the developing countries, as the willingness to pay for nonconsumptive use and nonuse values of natural resources among residents of developing countries is often relatively lower than in developed nations, even after controlling for income differences (Herath, 2002).

However, tourism is a highly vulnerable activity where tourists display voluntary and discretionary behavior. Although entry fees are among the few policy tools available to capture directly tourism expenditures at the reserve gate, determining what to charge tourists to experience a natural area is challenging since there are no readily available market signals (Pigram and Wahab, 1997). Nonetheless, Schultz, *et al.* (1998) find that the use of differential entrance fees for national parks and protected areas are useful to

33

generate revenues to recover costs, to ensure quality goods and services, to reduce congestion in over-crowded parks, and promoting visitation to less crowded parks.

In order to better gauge the value tourists place on the reserve and their sensitivity to changes in the costs of visiting Eduardo Avaroa, non-market valuation provides several valuable tools. Here, we explore the policy implications of two popular non-market valuation alternatives; the contingent valuation method and contingent behavior method. We compare the implications of adopting the entrance fee recommendations of these techniques on the revenues predicted to accrue to Eduardo Avaroa Reserve. The objective is to test whether there is a statistical difference, or even noticeable distinction in park entrance fee policy recommendations, between the two non-market valuation elicitation methods to facilitate the use of tourism as an engine of economic development. Our research highlights the challenges in using non-market valuation techniques for policy formation, particularly in a developing country setting.

2.1.2: Study Site: Eduardo Avaroa Reserve, Bolivia

Nestled in the southwest corner of Bolivia, the Eduardo Avaroa Reserve or Reserva Eduardo Avaroa (REA) is a Priority I ecoregion due to its unique ecological and archeological features. The reserve has an arid landscape, which consists of volcanoes, geysers, salt marshes and mountain lakes. Eduardo Avaroa Reserve spans an area of 1.8 million acres and has more than 50 archeological sites making it rich in cultural and archeological heritage. REA houses at least 190 species of plants and trees and 80 different species of birds including three of the world's six flamingo species. It is one of the most visited reserves in Bolivia and also one of the most economically depressed

34

regions in the country with threats to the region consisting of mining, poor farming practices and unregulated tourism. While tourism can serve as an income-generating activity for the region, uncontrolled tourism that is developed without consideration of the environmental and cultural impacts can adversely affect the natural areas. In order to avoid the potential negative impacts, a proposed fee increase is examined so to improve the park's reserve management (The Nature Conservancy, undated).

2.2: Theory

2.2.1: Estimating the Demand for Ecotourism Services

This study employs two methods to estimate the willingness to pay (WTP) for entrance to the Eduardo Avaroa Reserve and compares results from the contingent valuation method (CVM) and contingent behavior (CB) estimates of willingness to pay. The convergent validity between the two valuation methods is examined. Convergent validity investigates consistency of contingent valuation estimates with estimates provided by another non-market valuation method, in this case contingent behavior (Champ *et al.*, 2003). One issue that arises with convergent validity is strategic bias. Strategic bias exists when the respondent has the incentive to misrepresent their true preferences in order to achieve a more desired outcome. However, Boardman *et al.* (2005) states that when potential users are asked to choose between an existing and an alternative private good, the respondents have no incentive to misstate their true preferences over their choices. Although Eduardo Avaroa Reserve is itself a public good, entrance to the Reserve is rival and excludable it can be viewed as a private good from the individual respondent's perspective. Further, the survey respondents were asked if they would visit the park again if it included additional services (i.e. visitor's center and

35

improved park facilities) only available to those whom paid the increased fee level. Therefore, strategic bias is not an issue in valuing the willingness to pay for entrance to Eduardo Avaroa Reserve.

2.2.2: Contingent Valuation Method

The contingent valuation method is facilitated by positing behavioral changes due to different fee levels contingent on the provision of a new visitor center, improved park services and facilities and local naturalist tour guides. It is a direct interview (i.e. survey) approach that can be used to provide acceptable measures of the economic value of recreation opportunities as well as the preservation of natural resources (Loomis and Walsh, 1997). The object of CVM is to measure consumer surplus for the environmental attributes of a tourism product at a specific destination (i.e. National Park or Reserve). To remain consistent with consumer choice theory, the elicitation of WTP needs to propose hypothetical or contingent changes and improvements to the parks or other tourism product being valued (Shultz *et al.*, 1998).

Herath (2002) argues that in cases where revealed preference methods (e.g., travel cost method) are not appropriate, stated preference methods, such as CVM, are the most useful analytical approach. There are two advantages of using the contingent valuation method. First, CVM is able to assess not only an individual's WTP of the present conditions of a park, but it also values their WTP with hypothetical changes to the park. Secondly, CVM is able to value trips with multi-destinations by asking hypothetical questions for each specified destination (Lee and Han, 2002). Since the Eduardo Avaroa

36

Reserve is not a tourist's sole destination in Bolivia, CVM is an appropriate valuation approach in this case.

2.2.3: Contingent Behavior Method

While the contingent valuation method elicits a value statement for a non-market good, contingent behavior is used to estimate changes in behavior for a non-market good. The contingent behavior method asks respondents about their intended visitation behavior given a proposed change to the site (Chase *et al.*, 1998). Specifically, the contingent behavior method is used to measure the current number of days the respondent plans to spend at REA with the current fee level and the number of days they would plan to spend at REA with hypothetical changes to the park under a new fee level that is randomly chosen among respondents. The hypothetical changes proposed under the contingent behavior scenario are identical to those proposed under the contingent valuation scenario.

Chase *et al.* (1998) uses the contingent behavior method to generate experimental data and assess the effects of differential pricing of entrance fees on the demand of park visitation in Costa Rica. Specifically, park visitation demand functions and price and income elasticities are estimated for three parks in Costa Rica. Further, applications of differential pricing to the parks are discussed. It is concluded that WTP estimates for park entrance fees act as a "reference point" from which judgments are based (Chase *et al.*, 1998). Grijalva *et al.* (2002) tested the validity of data obtained via the contingent behavior method, while valuing the demand for rock climbing at Hueco Tanks Texas State Park (USA). Their results indicate that climbers do not appear to overstate their behavioral changes when presented with a hypothetical situation (Grijalva *et al.*, 2002).

37

In the case of REA, there is not a differential pricing strategy under consideration in determining optimal entrance fee levels. However, the contingent behavior method is also applicable to non-differential pricing of entrance fees. Here, the contingent behavior method is used to measure the current number of days the respondent plans to spend at REA with the current fee level and the number of days they would plan to spend at REA with hypothetical changes to the park under a new fee level chosen from a range of feasible changes that is randomly exposed to respondents.

2.2.4: Contingent Valuation and Contingent Behavior Combined

The contingent valuation method is not a perfect substitute for having revealed preference information, and will not provide all the answers for valuing ecotourism, but it is among the very few methods available to measure economic value where there is no market information. However, Herath (2002) contends that diversity in CVM applications is required to suit different circumstances, particularly in an ecotourism context. Adamowicz *et al.* (1994) argue that the strength of the contingent valuation method as a natural resource valuation tool is improved if it is implemented in combination with another non-market valuation technique. Here, we explore this contention by including both contingent valuation and contingent behavior estimates.

Relative to contingent behavior, the contingent valuation method might be a more common method for valuing non-market goods such as National Parks or Reserves; however, it has one limitation that the contingent behavior method can overcome. In using standard survey techniques for CVM, it is not possible to collect data necessary to estimate an unrestricted system of demand equations that can be used in designing

38

effective pricing policies. In order to accomplish this, the contingent behavior method

needs to be applied in conjunction with contingent valuation (Chase *et al.*, 1998).

The contingent behavior method is viewed as controversial due to its intrinsically

hypothetical nature; however, since there is only minimal focus of nonuse values using

CB, the limitations of the contingent valuation method might not hold for data obtained

through its combination with the contingent behavior method (Grijalva *et al.*, 2002).

Grijalva *et al.* (2002) find that methods of augmenting revealed preference data with

stated preference data show promise as a tool for estimating demand for a choice-based

sample.

To date, no literature combining the contingent valuation method and contingent

behavior used to value a National Park or Reserve in a developing country has been

identified. This is among the contributions of this study to the body of natural resource

economic valuation literature. Our study of entry fee policy of the REA compares and

contrasts CV data with CB data and then pools them in helping us to understand the use

of these methods within a developing country setting.

2.3: Methodology

Deriving an accurate nonconsumptive use value is dependent on the survey

method and the direct face-to-face interview is the most commonly used approach at

recreation sites. Similar to our approach in the REA, Lee and Han (2002) used the face-

to-face interview method in valuing multi-destination trips and, logically, use entrance

fees as their payment vehicle. Lee and Han (2002) conclude that an increase in entrance

fees is justified in order to maintain the quality of the environment being valued.

2.3.1: Data Collection

Visitation to the Eduardo Avaroa Reserve is valued through cross-sectional data obtained from a combination of in-person interviews and self-administered surveys collected at the reserve during April 2003. The survey was administered in English, French, and Spanish to accommodate the preferences of REA park visitors from abroad. A randomized design was employed to distribute the referendum format elicitation question in the contingent behavior (Appendix IIA: Contingent Behavior Survey Format) and contingent valuation (Appendix IIB: Contingent Valuation Survey Format) treatments.

2.3.2: Survey Format

Creating a market for the non-market good being valued requires an appropriate question format. Among the several types of question formats, the dichotomous choice format follows the recommendation of the US Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) report on CVM (Leon, 1997). In a dichotomous choice format, the respondent is asked whether they would accept or reject a suggested price, which varies randomly among respondents, under a hypothetical situation. Loomis and Walsh (1997) state that it is easier for respondents to make their decisions in using this format because discrete choices are similar to choices made in market transactions. Lee and Han (2002) use the dichotomous choice question format to value five different National Parks in Korea. Leon's (1997) study in the Canary Islands found that the single-bounded dichotomous choice method produced higher values than

40

the double-bounded and open-ended methods, implying the single-bounded method might overestimate consumer surplus, while the double-bounded method obtained more consistent results. Dichotomous choice or referendum produces more valid responses than open-ended and iterative bidding question formats (Loomis and Walsh, 1997; Leon, 1997; Fredman and Emmelin, 2001).

Our survey was distributed to current visitors of the Eduardo Avaroa Reserve by intercepting them at the entrance and exit of the park. The contingent scenario provided to the respondents was the same for both the contingent behavior and contingent valuation surveys. The contingent scenario was defined as the following:

> *In Eduardo Avaroa, the Bolivian Park Service charges visitors US $5 per person to pay for protecting the reserve (the fee is only paid once, regardless of how many days you stay). The Park Service may decide to charge a higher fee – with money being used to improve visitor services and facilities. For example, the income would be used to build and maintain a visitor center and to train local naturalist guides.*
>
> *This fee would increase the cost of your visit, as operators would add it to your tour price. We would like to know how this would affect your trip. Please assume that the fee changes only at Eduardo Avaroa – not at other parks.*

The difference between the two valuation methods lies with the willingness to pay question. The contingent valuation question was a dichotomous choice question and was stated as the following:

> *If the trip price had been US $X higher than what you paid, would you still have come to the reserve?*

41

The respondents could either state yes, they would still come to the reserve (coded as 1) or no they would not have come to the reserve (coded as 0).

For the contingent behavior question, the respondents were given three options to respond to the question, which was stated as the following:

If the price had been US $X higher than what you paid, what would you have done?

The three options the respondents could choose from were indicated as follows:

1. I would have kept the same itinerary of visiting parks.

2. I would have made a different itinerary of visiting parks.

3. I would not have visited any parks.

In order to compare responses with the dichotomous choice contingent valuation questions, the contingent behavior question was coded as a dichotomous choice question. If the respondents stated that they would have kept the same itinerary of visiting parks it was coded as a one. If the respondents stated that they would have made a different itinerary, they were further asked the days they would spend at the Eduardo Avaroa Reserve along with other parks in Bolivia and in other countries. If the respondent stated that they would spend zero days at the Eduardo Avaroa Reserve after the fee increase, their response was coded as a zero. If the respondent stated that they would spend at least one day at the reserve after the fee increase, their response was coded as a one. Lastly, if the respondents chose the option of not visiting any parks, their response was coded as a zero.

42

2.3.3: Model Specification and Hypotheses

Using non-market valuation and a dichotomous choice question format, the binomial logit regression is an appropriate statistical analysis tool for this study. The binomial logit is an estimation technique for equations with a dichotomous qualitative dependent variable. The dependent variable is the log of the odds that the choice in question will be made (Studenmund, 1997). Under both scenarios, the dependent variable is 1 if the respondent would continue to visit the Eduardo Avaroa Reserve and 0 if the respondent would not continue to visit the Eduardo Avaroa Reserve, given a site improvement.

The objective of this study is to test whether there is a statistical difference between two non-market valuation elicitation methods and a pooled model incorporating both techniques. In addition, the willingness to pay for visiting the park is compared between the contingent valuation and the contingent behavior methods. The following logit regression was used for these analyses:

$$\text{Vote} = \beta_0 - \beta_1 \text{ Bid Amt} + \beta_2 \text{ Europe} + \beta_3 \text{ Income} + \beta_4 \text{ Tour Package} \qquad (1)$$

The variables used for the analysis were the proposed increase in the fee amount (Bid Amt), European country of origin (Europe), annual household income (Income) and tour package inclusion (Tour Package). The entrance fee bid amounts took on the following values: $5, $10, $20, $30, $50, and $75 in addition to the current $5 entrance fee level. The bid amounts were evenly distributed among respondents and between the two valuation techniques. The European country of origin variable is a dummy variable based on the country where the respondent lives and was coded as: 1=European Country and 0=Non-European Country. The countries classified as European countries were: United

43

Kingdom, France, Germany, Netherlands, Switzerland, and Ireland. The countries

classified as non-European countries were: Israel, Australia, United States, and Canada.

There was also a category of "Other Countries" that fell under the non-European

category. The income variable was the respondents' median annual household income.

Further, any questions pertaining to specification of a monetary level (i.e. annual income)

allowed for answers in foreign currencies. Currency amounts were normalized to United

States dollars. The tour package inclusion variable is a dummy variable on whether the

respondent traveled as part of tour package (coded as 1) or whether the respondent

traveled independently (coded as 0) during his or her time in Bolivia (Table 2.1).

Table 2.1: Explanation of Variables

Variable	Explanation
Age	Age of the respondent. Coded as: 18=Under 18 years, 23.5=18-29 years, 34.5=30-39 years, 44.5=40-49 years, 54.5=50-59 years, and 60=60 years or over
Bid Amount	Bid Amount, with the following values: $5, $10, $20, $30, $50, and $75
Days in Bolivia	The number of days the respondent will spend in Bolivia on his/her current trip
Days in Eduardo Avaroa Reserve (REA)	The number of days the respondent will spend in the Eduardo Avaroa Reserve on his/her current trip
Days in Latin America	The number of days the respondent will spend in Latin America on his/her current trip
Days in Other Bolivian Parks	The number of days the respondent will spend in other nature reserves or parks in Bolivia on his/her current trip
Days in Other Countries' Parks	The number of days the respondent will spend in other nature reserves or parks in other countries on his/her current trip
Education	Education level of the respondent. Coded as: 8=Primary school, 12=High school (diploma), 16=Undergraduate college/university (e.g. Bachelors), and 18=Graduate (e.g. Masters or Ph.D.)
European	Dummy variable: 1 if the respondent lives in a European country, 0, if the respondent lives in a non-European country
Gender	Dummy variable: 1 if the respondent is Female, 0 if the respondent is Male
Income	Annual household income of the respondent (Converted into US Dollars)
Total Days on Trip	The number of days the respondent will spend in total on his/her

44

| Total Amount Spent in Bolivia | The amount of money the respondent will spend in total for his/her time in Bolivia, including airfare, accommodations, food, souvenirs and other expenses |
| Tour Package | Dummy variable: 1 if the respondent is traveling as part of a tour package during his/her time in Bolivia, 0 if the respondent is traveling independently during his/her time in Bolivia |

The gender variable was coded as 1 for female respondents and 0 for male respondents. The age variable was coded as the average age within each given range of ages and divided into the following categories: 18 = Under 18 years, 23.5 = 18-29 years, 34.5 = 30-39 years, 44.5 = 40-49 years, 54.5 = 50-59 years and 60 = 60 years or over. The education level of the respondents was defined as the typical number of years necessary to complete the respective levels of education, and coded as follows: 8 = Primary school, 12 = High school (diploma), 16 = Undergraduate college or university (e.g. Bachelor's), and 18 = Graduate school (e.g. Master's or Ph.D.). The sample size between the two scenarios was 187 and 194 for the contingent behavior and contingent valuation scenarios, respectively.

In order to compare the difference between contingent valuation and contingent behavior valuation, descriptive statistics and demand elasticities were calculated. Econometric tests were also conducted to evaluate the statistical difference between the two models as well as the statistical difference between willingness to pay under the contingent valuation scenario versus the contingent behavior scenario. In order to evaluate the statistical difference between the two models, the following null hypothesis was tested:

$$H_o: \beta_{\text{Contingent Valuation}} = \beta_{\text{Contingent Behavior}}$$

45

The vector of coefficients for each valuation method is denoted as β. In order to test for the coefficient equality, a likelihood ratio (LR) test needs to be performed. The LR test involves taking the difference of the restricted log likelihood function (log likelihood of the pooled model) from the unrestricted log likelihood function (summation of log likelihood for each ethnicity model) and multiplying the difference by negative two. The result is the calculated chi-square and if it is greater than the critical chi-square statistic then the coefficients across the two methods are statistically different from each other (Gujarati, 2003). The three models used for this analysis were the contingent behavior model only, contingent valuation model only and a pooled model of all the data. In addition, a pairwise t-test was conducted to test for significant difference between the contingent behavior and contingent valuation models. The t-test is used to test for significance across coefficients between the two models (Stephenson, undated). The equation for the t-test is as follows:

$$SE(\beta_{CVM} - \beta_{CB}) = S_P \sqrt{[(1/n_{CVM}) + (1/n_{CB})]} \qquad (2)$$

It is, essentially, the standard error between the two coefficients, where n is the number of observations for each sample and β is the coefficient value for the willingness to pay for each sample. The pooled standard error, denoted as S_P, is calculated as follows:

$$S_P = \sqrt{\{[(n_{CVM}-1)*S_{CVM}^2 + (n_{CB}-1)*S_{CB}^2] / (n_{CVM} + n_{CB} -2)\}} \qquad (3)$$

Where, S^2 is the variance of the willingness to pay coefficient for the contingent valuation logit regression and the contingent behavior logit regression, respectively.

It is hypothesized that the willingness to pay for the Eduardo Avaroa Reserve will vary across valuation methods. In order to test the difference in willingness to pay across elicitation methods, the following hypothesis is tested:

46

H_o: WTP$_{\text{Contingent Valuation}}$ = WTP$_{\text{Contingent Behavior}}$

To test for statistical difference between willingness to pay across non-market valuation methods, the confidence intervals for the mean willingness to pay values for each scenario were derived.

Further, the differences in the price elasticities and the differences in the expected value of revenue among the two elicitation methods are compared. The hypothesis is that the price elasticities will not be equal under each valuation scenario. The following null hypothesis is examined:

H_o: Price Elasticity$_{\text{Contingent Valuation}}$ = Price Elasticity$_{\text{Contingent Behavior}}$

In addition, it is hypothesized that the total expected value of revenue impact for each fee level will be different under each valuation scenario. Therefore, the null hypothesis to be evaluated is:

H_o: Expected Revenue$_{\text{Contingent Valuation}}$ = Expected Revenue$_{\text{Contingent Behavior}}$

The method used to calculate the price elasticities and total expected value of revenue impacts will be described in detail in the next section.

2.3.4: Elasticity and Expenditure Calculations

A logit regression model has a dependent variable that is the log of the odds ratio instead of the actual variable; therefore, it is difficult to calculate price elasticity. However, through some mathematical manipulation, elasticities can be derived. By using the forecasting command in EViews, an econometric software package, one can expand the sample. The reason for expanding the sample is to forecast the willingness to pay values, given our estimates, for each bid amount level. From this the elasticity estimates

47

can be derived. The sample size was expanded by six observations to account for each bid amount level. Next each bid amount was entered into the forecast sample. With the expanded sample size, the logit regression was run with the dependent variable as is in the previous model and the only independent variable was the bid amount. Once the regression was run, the forecasted dependent variable for each given bid amount was obtained from the dependent variable data series.

Since all of the respondents were currently visiting the park at the current fee level of $5.00, it was assumed that all the respondents would attend the park at this fee level. It can then be assumed that the mean dependent variable would be equal to one at the $5.00. With this assumption and the forecasted dependent variables for each bid amount, the elasticity can be calculated. The elasticity was calculated by dividing the percentage change in the dependent variable by the percentage change in the bid amount. The elasticity was calculated for each given bid amount in addition to the current fee level of $5: $5, $10, $20, $30, $50 and $75. Therefore, the proposed fee levels were: $10, $15, $25, $35, $55 and $80.

With the elasticity calculations, the average amount spent in the Eduardo Avaroa Reserve obtained from the survey and the annual visitation obtained directly from REA, the expected value of revenue can be calculated. Since the elasticities were calculated for each proposed new bid amount, then the annual expected expenditure levels for REA based on each given fee level can also be calculated. The average amount spent in REA per visitor was derived by multiplying the number of days spent at the park by the respondents' average daily expenditure in Bolivia. The total visitation for REA in 2000 was 26,150 visitors, which will be used in the expected expenditure impact calculation.

Before the expected value of revenue can be derived, the expected probability of

the number of visitors to REA needs to be determined for each bid amount. The expected

probability of the change in number of visitors (i.e. the expected decrease in visitors) was

calculated by multiplying the number of visitors in 2000 by the elasticity associated with

each bid amount. In order to get the total expected visitors with a fee increase, the

expected change in number of visitors was subtracted from the number of visitors in

2000. This calculation displays how responsive park visitation is relative to a change in

the entrance fee level. The expected value of revenue can then be determined by

multiplying the expected probability number of visitors by the daily average amount

spent in REA for each fee level.

2.4: Results

Pairwise t-tests were performed comparing the mean values of the respondents'

demographics across both valuation samples. The demographics under both scenarios

were not significantly different from each other with the exception of the number of days

the respondents spend in Latin America, which was statistically distinct, if not policy

relevant, at the 90% level. The mean values of the descriptive statistics for the contingent

behavior sample, the contingent valuation sample and the samples pooled together can be

seen in Table 2.2.

Table 2.2: Descriptive Statistics

Mean Values	CB	CV	Pooled
Gender	0.47	0.46	0.47
Age	28.30	27.61	27.96
Education	16.35	16.02	16.18
Income	$ 36,684	$ 37,887	$ 37,297
Travel Statistics			
Days in Latin America	126.3	111.2	118.6
Days in Bolivia	26.5	26.2	26.4
Days in REA	3.0	3.0	3.0
Days in Other Bolivian Parks	3.2	3.0	3.1
Days in Other Countries' Parks	11.0	12.3	11.7
Total Days on Trip	174.1	177.2	175.7
Tour Package Purchase	0.56	0.58	0.57
Avg. Amt. Spent in REA	$ 83.52	$ 72.19	$ 77.70
Avg. Amt. Spent in Other Bolivian Parks	$ 89.23	$ 72.07	$ 80.26
Total Amount Spent in Bolivia	$ 730.43	$ 637.09	$ 682.66
Number of Observations	187	194	381

In summary, the survey sample was split evenly between male and female respondents. The average respondent ranged in ages from 27 to 29 and completed a Bachelor's degree as their highest level of education. They spent an average of 26 days in Bolivia, while three days were spent at the Eduardo Avaroa Reserve and three days were spent at other national parks within Bolivia. Approximately 60% of the respondents spent their time in Bolivia through a tour package. The respondents from the contingent behavior sample spent roughly one hundred dollars more on their trip than did the respondents from the contingent valuation sample. On average, the respondents from the contingent behavior sample spent $10 more per day in REA than did the respondents from the contingent valuation sample. In addition, the respondents traveled from a variety of countries for their trips to Bolivia (Table 2.3).

50

Table 2.3: Respondents' Countries of Origin

Country of Origin	CB Count	CB %	CV Count	CV %	Pool Count	Pool %
United Kingdom	65	34.6%	72	36.7%	137	35.7%
France	19	10.1%	21	10.7%	40	10.4%
Germany	14	7.4%	17	8.7%	31	8.1%
Netherlands	12	6.4%	14	7.1%	26	6.8%
Switzerland	12	6.4%	6	3.1%	18	4.7%
Ireland	4	2.1%	4	2.0%	8	2.1%
Total European Countries	126	67.0%	134	68.4%	260	67.7%
Israel	17	9.0%	26	13.3%	43	11.2%
United States	14	7.4%	6	3.1%	20	5.2%
Australia	6	3.2%	7	3.6%	13	3.4%
Canada	8	4.3%	1	0.5%	9	2.3%
Other	17	9.0%	22	11.2%	39	10.2%
Total Non-European Countries	62	33.0%	62	31.6%	124	32.3%
TOTAL	188	100.0%	196	100.0%	384	100.0%

Approximately 67% of the respondents traveled from European countries. The top three countries the respondents traveled from in descending order was United Kingdom, Israel, and France, consisting of over half the sample size.

The majority of these variables were used to evaluate the data, where the dependent variable was whether (coded as 1) or not (coded as 0) the respondent would visit REA with a fee increase. However, the only variables that were significant were the increased entrance fee level (Bid Amt), whether the respondent originated from a European country or not (European), the respondents annual median household income in thousands of dollars (Income), and whether the respondent did his or her traveling through a tour package or not (Tour Package) (Table 2.4).

51

Table 2.4: Contingent Behavior, Contingent Valuation and Pooled Logit Regressions

Variable	Contingent Behavior			Contingent Valuation			Pooled Model		
	Coeff	Std. Error	z-Stat	Coeff	Std. Error	z-Stat	Coeff	Std. Error	z-Stat
Constant	0.52	0.59	0.88	0.95**	0.47	2.04	0.77**	0.34	2.25
Bid Amt.	-0.03***	0.01	-4.33	-0.07***	0.01	-6.63	-0.05***	0.01	-8.02
European	0.68*	0.40	1.71	1.53***	0.43	3.57	0.92***	0.27	3.43
Income	0.03***	0.01	2.49	0.01	0.01	0.81	0.01***	0.01	2.64
Tour Package	0.93**	0.40	2.35	0.39	0.38	1.00	0.59**	0.26	2.29
Mean dep. Var.		0.76			0.58			0.67	
S.E. of regression		0.38			0.38			0.40	
Log likelihood		-83.18			-86.59			-186.72	
Restricted log likelihood		-102.03			-131.82			-241.10	
LR statistic (3 df)		37.70			90.47			108.77	
Probability. (LR stat.)		0.00			0.00			0.00	
Mc Fadden R^2		0.18			0.34			0.23	
Number of Observations		187			194			381	

* p < 0.10; ** p < 0.05; *** p < 0.01

As can be seen in Table 2.4, the direction of the estimated coefficients of both elicitation methods are consistent with economic theory, resulting in theoretical convergent validity thus strategically consistent, but financially distinct. Further, the coefficients can be compared to determine if they are significantly different from one another for the CB and CV regressions through a likelihood ratio test. Also, a pairwise t-test on the mean dependent variable for both models can be performed in order to determine if the two regressions are statistically different from one another. Since the Bid Amt variable is significant in the contingent behavior and contingent valuation models,

52

the willingness to pay extracted from each model can be evaluated to see if they are significantly different from one another.

In order to test for the coefficient equality, a likelihood ratio (LR) test was performed. The resulting calculated chi-square is 33.91. With five degrees of freedom, the critical chi-square value is 15.09 at the 99% confidence level. Therefore, we can reject the null hypotheses and conclude that at least one of the contingent valuation and contingent behavior coefficients are significantly different at even the 99% level.

In order to further analyze the statistical difference among regressions, a pairwise t-test on the mean of the dependent variables was used. The calculated t-statistic was 4.63 and the corresponding critical t-statistic was 2.33 at the 99% confidence level. This provides further evidence that the contingent behavior model is significantly different than the contingent valuation model.

Since the bid amount variable is statistically significant for both models, the confidence intervals on the mean willingness to pay values need to be calculated in order to test for significant difference between the willingness to pay across the valuation methods. The mean willingness to pay was calculated using the following formula:

$$\text{Mean WTP} = (\ln (1 + \exp(\alpha))) / \beta \qquad (4)$$

The product of the coefficient and mean values for all independent variables (constant, income level, European country, tour package) excluding the bid coefficient is denoted by α and β is the absolute value of the bid coefficient (Park *et al.*, 1991). The mean willingness to pay values and the respective confidence intervals for each valuation technique is in Table 2.5.

53

Table 2.5: Mean WTP and Confidence Intervals for the Two Elicitation Methods

	Mean	90% Confidence Interval
Contingent Behavior	$ 76.50	$62.58 - $104.37
Contingent Valuation	$ 36.73	$32.38 - $42.68

The mean willingness to pay under the contingent behavior scenario is more than double the mean willingness to pay under the contingent valuation scenario. The confidence intervals for each scenario do not overlap with each other; therefore, the willingness to pay under the contingent behavior scenario is significantly different from the willingness to pay under the contingent valuation scenario.

Further, by calculating the price elasticities for each scenario, it reveals that we are in the inelastic portion of the demand curve. This is more than likely due to the fact that the entrance fee to the Eduardo Avaroa Reserve is a small portion of the tourists' income or the fact that the entrance fee is already captured in the pre-purchased tour package. If an entry fee to the park doubled from $5.00 to $10.00, the contingent behavior analysis predicts a 0.11% decrease in the likelihood the respondent would visit the park, whereas our contingent valuation analysis is slightly more elastic. The contingent valuation analysis predicts a 0.13% decrease in the likelihood of a visit given a one hundred percent increase in the entrance fee. The combined analysis predicts a 0.01% decrease in the likelihood of a visit, given a one hundred percent increase in the entrance fee (Table 2.6).

54

Table 2.6: Price Elasticities for each Proposed Fee Level Across Valuation Techniques

Increase in Bid Amount	CB	CV	Pool
$ 10	-0.105	-0.134	-0.013
$ 15	-0.061	-0.086	-0.077
$ 25	-0.040	-0.068	-0.054
$ 35	-0.034	-0.067	-0.049
$ 55	-0.033	-0.069	-0.049
$ 80	-0.035	-0.060	-0.049

Therefore, the results of the contingent behavior model are substantially different than the results generated from the contingent valuation model. Further, it is important to note that the respondents to the contingent valuation scenario are more price sensitive to changes in the entry fee than the respondents to the contingent behavior scenario. As a result, the optimal entry fee pricing strategy will be the same for each valuation technique employed, however, the expected expenditure impacts will be different across valuation techniques.

The total expected expenditure impact can be evaluated from these elasticities combined with the 2000 visitation level and the average REA expenditures. The total impact for each bid amount under the two elicitation methods can be seen in detail in Table 2.7.

Table 2.7: Total Expected Expenditure Impact for each Proposed Fee Level Across Valuation Techniques

Bid Amount	CB	CV	Difference
$ 10	$ 2,277,886	$ 2,030,438	$ 247,448
$ 15	$ 2,409,559	$ 2,162,052	$ 247,508
$ 25	$ 2,671,461	$ 2,423,763	$ 247,698
$ 35	$ 2,933,032	$ 2,685,112	$ 247,920
$ 55	$ 3,455,889	$ 3,207,698	$ 248,192
$ 80	$ 4,109,341	$ 3,861,344	$ 247,997

The expected annual impact under the contingent behavior scenario is approximately $250,000 greater than the expected impact under the contingent valuation scenario. This result illustrates that there is a financially important difference in interpreting the results from among non-market valuation techniques and therefore any potential compensatory policy alternatives. Hence, it is important to incorporate both of these models when performing non-market valuation as they produce differing results.

2.5: Conclusion

Ecotourism has grown in importance during the past decade and it has become a major asset to the economies of developing countries (Chase *et al.*, 1998). Our results show that visitors' willingness to pay contingent on park management improvements is greater than what they are currently being charged. Chase *et al.,* (1998) suggests that as fees are increased, the reference point from which judgments of WTP are based will shift and cause the current level of WTP to increase. This occurs in the case of valuing the three parks in Costa Rica and if more countries follow the format of increasing entrance fees tourists may become accustomed to paying more substantial fees (Chase *et al.*, 1998).

In order to put a value on goods where there is no market available, such as a national park, a form of non-market valuation needs to be used to obtain a measure of willingness to pay for the national park. Two forms of non-market valuation are the contingent valuation method and contingent behavior method. The logit model is used to

56

determine the likelihood of the respondent visiting the park, contingent on a hypothetical scenario and a given bid amount.

In order to examine the difference between the two samples (contingent valuation and contingent behavior), the likelihood ratio test was used to compare the significance between the coefficients of the regressions. The regressions between the two samples were theoretically similar but statistically different; there was a significant difference between willingness to pay for the contingent behavior scenario versus contingent behavior scenario. The willingness to pay under the contingent behavior scenario is greater than the willingness to pay under the contingent valuation scenario. Further, the elasticity with respect to the bid amount is less inelastic in the contingent behavior scenario than the contingent valuation scenario, which leads to a $250,000 annual difference in total expected expenditure impacts.

Theoretically, both valuation techniques provide similar results. However, with further econometric testing the two non-market valuation techniques provide different statistical results. Further research needs to be conducted in order to determine whether one valuation technique is superior. In the case of valuation of Eduardo Avaroa Reserve, the statistical differences in willingness to pay responses lead to financially important differences in predicted fee levels, visitation levels and revenues. The results produce a large divergence in expected economic impacts across the two non-market valuation methods. Therefore, in developing countries, it is advisable to employ more than one non-market valuation technique toward the support of any protected area to assist in balancing out predictions.

REFERENCES

Adamowicz, Wiktor L, J. Louviere, and M. Williams. May 1994. "Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities." *Journal of Environmental Economics and Management*, 26(3): 271-92.

Boardman, Anthony E., David H. Greenberg, Aidan R. Vining, and David L. Weimer. 2005. *Cost-Benefit Analysis: Concepts and Practice.* 3rd ed. Prentice Hall: Upper Saddle River, NJ

Champ, Patricia A., Kevin J. Boyle and Thomas C. Brown. 2003. *A Primer on Nonmarket Valuation.* Kluwer Academic Publishers: Norwell, MA. p. 269-329.

Chase, Lisa C., David R. Lee, William D. Schulze, and Deborah J. Anderson. November 1998. "Ecotourism Demand and Differential Pricing of National Park Access in Costa Rica." *Land Economics*, 74(4): 466-82.

Fredman, Peter and Lars Emmelin. 2001. "Wilderness Purism, Willingness to Pay and Management Preferences: A Study of Swedish Mountain Tourists." *Tourism Economics*, 7(1): 5-20.

Grijalva, Therese C., Robert P. Berrens, Alok K. Bohara, and W. Douglass Shaw. May 2002. "Testing the Validity of Contingent Behavior Trip Responses." *American Journal of Agricultural Economics*, 84(2): 401-14.

Gujarati, Damodar N. 2003. *Basic Econometrics.* 4th ed. McGraw-Hill Company. p. 595-8, 604-7, 633-5.

Herath, Gamini. 2002. "Research Methodologies for Planning Ecotourism and Nature Conservation." *Tourism Economics*, 8(1): 77-101.

Lee, Choong-Ki and Sang-Yoel Han. 2002. "Estimating the Use and Preservation Values of National Parks' Tourism Resources Using a Contingent Valuation Method." *Tourism Management*, 23: 531-40.

Leon, Carmelo J. 1997. "Valuing International Tourism Benefits from Natural Areas." *Tourism Economics*, 3(2): 119-36.

Loomis, John B. and Richard G. Walsh. 1997. *Recreation Economic Decisions: Comparing Benefits and Costs*, 2nd ed. State College, PA: Venture Publishing, Inc.

58

Park, Timothy, John B. Loomis, and Michael Creel. February 1991. "Confidence Intervals for Evaluating Benefits Estimates from Dichotomous Choice Contingent Valuation Studies." *Land Economics*, 67(1): 64-73.

Pigram, John J. and Salah Wahab. 1997. "Sustainable Tourism in a Changing World." In Salah Wahab and John J. Pigram (Eds.), *Tourism Development and Growth: The Challenge of Sustainability* (pp. 17-32). New York: Routledge.

Shultz, Steven, Jorge Pinazzo, and Miguel Cifuentes. 1998. "Opportunities and Limitations of Contingent Valuation Surveys to Determine National Park Entrance Fees: Evidence from Costa Rica." *Environment and Development Economics*, 3:131-49.

Stephenson, W. Robert. Undated. "Two Independent Samples." Department of Statistics. Iowa State University.

Studenmund, A.H. 1997. *Using Econometrics: A Practical Guide* 3rd ed. Addison-Wesley Educational Publishers. p. 509-15.

The Nature Conservancy. Undated. "Eduardo Avaroa Andean Fauna National Reserve, Bolivia." Fact Sheet.

Wall, Geoffrey. 1997. "Sustainable Tourism - Unsustainable Development." In Salah Wahab and John J. Pigram (Eds.), *Tourism Development and Growth: The Challenge of Sustainability* (pp. 33-49). New York: Routledge.

Wunder, Sven. 2000. "Ecotourism and Economic Incentives – An Empirical Approach." *Ecological Economics*, 32: 465-79.

CHAPTER 3: SCENIC ROADWAY FROM EL CALAFATE TO GLACIERS NATIONAL PARK, SANTA CRUZ, ARGENTINA

3.1: Introduction

3.1.1: Introduction

Unique natural resources are often managed as parks or protected areas and the economic benefit derived by gateway communities comes primarily from the demand to experience these projected areas by tourists (Eagles and McCool, 2002). However, a visitor's experience does not necessarily begin upon arrival to the park or protected area; it begins once the visitor departs for their tourist destination (Clawson and Knetsch, 1966). Specifically, scenic viewscapes along the road towards a tourist's destination may provide additional benefits to the tourist and his or her experience. These additional benefits can be translated into additional income for the local economy.

However, the protected area management perspective of tourists, protected area managers, local communities and broader society may differ substantially. For example, entrance fees are the principal policy lever available to protected area managers to raise income and manage tourist demand. Since entrance fees and visitation are inversely related, an increase in park fees may (or may not) increase park revenues, but has an unambiguously negative effect on receipts in gateway communities (Kido and Seidl, 2007; Kido et al., 2005). In addition, tourist expenditures may occur at the protected area (e.g. souvenirs), in the gateway community (e.g. food and beverages, hotels, tours, local transportation), or well outside of the locality (e.g. airline tickets, package tours).

60

If infrastructure development were to be added along the roadway so as to disturb the undeveloped viewscape, economic activity in the region may increase or decrease as a result of the level of development along the roadway due to consumer preferences. While the influence of most physical developments on economic returns to the region is quite easily understood through market signals, the potential benefit of *not* developing the roadway may be substantially less easily detected and analyzed. Since tourists may enjoy one view over another through their direct experience, but do not consume or possess the view in a way that other travelers or residents cannot also enjoy it, viewscapes have features of public goods. Therefore, the viewscape will be underprovided by market mechanisms due to free riding behavior. Free riding behavior occurs when consumers do not pay for access or supply the good (Varian, 1984). Specifically, the tourists' nonconsumptive use value needs to be estimated in order to approximate the value of the viewscape. The purpose of this study is to estimate the economic value of an undeveloped scenic roadway to nonresident visitors to Glaciers National Park in the El Calafate region of the state of Santa Cruz, Argentina.

3.1.2: Study Site: Scenic Roadway from El Calafate to Glaciers National Park, Argentina

El Calafate is the gateway community to Glaciers National Park, a UNESCO World Heritage site, located 80 km to the west of town along Provincial Highway #11. The UNESCO World Heritage Site showcases a unique natural phenomenon wherein a several hundred foot tall and several miles wide blue hued glacier slowly flows to a point of land, temporarily creating two lakes separated by an ice plug from a contiguous body of water. The water level gradually rises in the south side lake, creating pressure on the

61

plug. After a period of several years the pressure on the plug becomes so great that it is spectacularly destroyed and water rushes from the south lake to the north lake for those fortunate enough to be in attendance to view it. However, even when the peak performance is not an offer, visitors are entertained by enormous icebergs periodically separating themselves from the descending glacier and plummeting into the icy waters of the lake.

The Park is the primary attraction for visitors to the region, although there is significant regional hiking and mountaineering activity, highlighted by the relative proximity of El Chalten, often known as Mt. Fitzroy. El Calafate provides most of the tourist services for Glaciers National Park, including the nearest commercial airport, restaurants, hotels, grocery stores and other services, while a few lodges exist very close to the park's entrance. After modest increases in tourist visits throughout the 1990s, Glaciers National Park has demonstrated an exponential increase in visitation in the years following Argentina's economic crash, more than tripling from 1999 levels to almost three hundred thousand in 2003 (Figure 3.1).

Figure 3.1: Glaciers National Park Annual Visitation
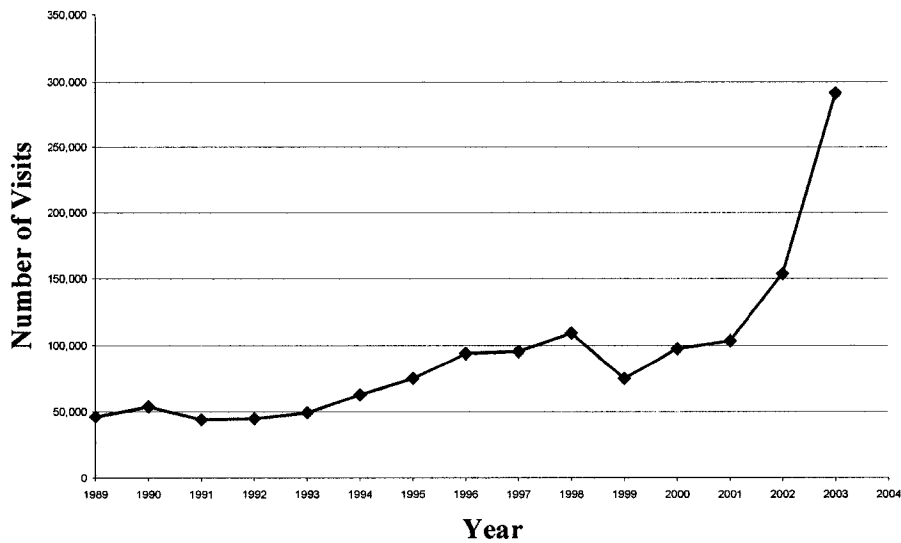
SOURCE: Argentina National Park Service, 2005

Due to the popularity of the Park and the unique natural environment of the region, development along the highway is an important planning decision for local leaders. Provincial Highway #11 between El Calafate and Glaciers National Park (Appendix IIIA: Map of Argentina) currently offers an open view of the snow-capped mountains, traditional wildlife, farms and ranches and the rugged Patagonian landscape. Currently, there are no electric lines, billboards, or other infrastructure development along the route, other than the paved two lane roadway.

3.2: Economic Valuation of Scenic Roadways

Although there are a number of studies of the economic value of agricultural and scenic open space to tourists (e.g., Bergstrom, *et al.*, 1985; Beasley *et al.*, 1986; Bower & Didychuck, 1994; Halstead, 1984; McConnell and Walls, 2005; McLeod, *et al.*, 1999;

63

Racevskis, *et al.*, 2000; Ready, *et al.*, 1997; Rosenberger and Loomis, 1999; and Willis and Garrod, 1993), there are no published accounts, to our knowledge, from the developing world. These published accounts typically use the travel cost method (TCM), or travel expenditure data, and the contingent valuation (CV) or contingent behavior (CB) method to estimate the nonconsumptive use value of open space to visitors.

Only one example of an economic valuation study of development and scenic roadways in any setting was found in the peer reviewed literature. In their study in Vermont, USA, using a travel cost model and contingent behavior approach, Tyrrell and Devitt (1999; 1996) found that nonresident respondents were willing-to-pay $0.76 (US$1995; $0.99 in 2005) per person-trip to travel along a 'scenic' designated highway as opposed to one without such a designation. Respondents preferred to see infrequent small towns to both no development and occasional houses and businesses. Respondents were willing to pay $1.49 ($1.94 in 2005) to travel along a roadway with infrequent small towns relative to scattered occasional houses and business and $1.20 ($1.57 in 2005) for small towns relative to no development at all. Average daily expenditures for non-resident sightseers was $160 ($208.71 in 2005).

In a meeting proceedings paper, using a similar approach, Mathews *et al.* (2004) find that predicted visitation to the Blue Ridge Parkway will decrease (increase) with declines (improvements) in visual quality along the roadway and from viewing stations, by approximately one-third. Mathews *et al.* (2004) find lost values of approximately $1,000 per visitor per year due to more developed views along the roadway and overlooks, which are then extrapolated to some $7.7 billion annually due to the extremely high number of visitors to the roadway.

64

3.2.1: Using Pictures of Alternative Levels of Development for Nonmarket Valuation

One attribute that may attract a visitor to his or her trip destination is the undeveloped viewscape the area possesses. However, the viewscape could be altered due to common forms of development. Altering a tourist destination's undeveloped viewscape has potential of shifting tourists' traveling decisions and perceptions of their travel experience. One way to gather information about a tourist's value of an undeveloped viewscape versus a viewscape with development infrastructure would be to ask them questions pertaining to the viewscape and questions contingent on if the viewscape were to be developed. However, one person's perception of development may be different than the next which could produce a variety of perspectives on development within the viewscape.

In order to make sure that the respondents' perceptions are similar in regards to the common forms of development, the survey could provide pictures of the differing levels of development for the nonmarket valuation questions. Bhat (2003) used pictures of differing preferred management levels to value improvements to coral reef in the Florida Keys. The respondents were then asked their visitation behavior over the next five years contingent on the quality levels of the coral reef. The data were constructed as a panel data set including revealed and stated preference data for each respondent (Bhat, 2003). Additionally, Bergstrom *et al.* (1985) utilized pictures to display undeveloped and developed current agricultural land to determine residents' willingness to pay for prime agricultural land amenities versus the occurrence of development of these lands. An ordinary least squares regression was employed to estimate the total value curve for

65

public amenity benefits of private agricultural land in South Carolina (Bergstrom *et al.*, 1985). This particular study uses digitally altered pictures of an undeveloped viewscape along a roadway to display the distinct types of development (Appendix IIIC: Valuation Scenarios) in conjunction with the contingent valuation and contingent behavior questions.

3.2.2: Intercept Surveys distributed In Different Languages in a Developing Country

Tourists not only travel within their own country but also to foreign countries where they may not know the native language. The use of translation tools assist the tourists in navigating throughout the country. However, the language barrier may prevent many tourists from participating in survey research conducted in the foreign country. By only administering a survey in the country's native language, a substantial portion of the tourist population may not be included in the sampling. Pizam (1999) summarized four studies regarding tour guides perceptions of international tourists in London, Israel, Korea and The Netherlands, which confirmed that tourists of different nationalities behave differently when on vacation in a foreign country. This leads to incomplete information regarding tourists' value of the good in question and its potential economic impact to the local economy if tourists of different nationalities, or cultures were systematically excluded from the surveying process due to language challenges. In order to capture the most input from the tourist population in countries with many international visitors, surveys need to be administered in the languages the tourists are comfortable communicating in.

Welch *et al.* (1973) and Weeks and Moore (1981) conducted two separate face-to-face interviews using English and Spanish. Welch *et al.* (1973) used three different interview groups, a Caucasian interviewer, a Hispanic interviewer and a team of one Caucasian and one Hispanic interviewer to interview Hispanics in Nebraska about different health and political issues. No statistically significant differences among responses across the different interviewers were found (Welch *et al.*, 1973). Weeks and Moore (1981) focused their face-to-face interviews on elementary school children in Miami, El Paso, N.E. Arizona and San Francisco. The survey was originally administered in English and then translated in Spanish at the request of the respondent. The study found no statistically significant differences among responses across the different locations and languages (Weeks and Moore, 1981). These two studies did not find any statistical significance across their responses when they allowed for differences in language during face-to-face interviews. However, Loomis *et al.* (2006) did find a statistical difference in willingness to pay for an expanded fire management program in California across ethnicities of respondents, Caucasians in English and Hispanics in Spanish. However, this survey was administered over the phone, so the ethnicity of the surveyor could not be visually assessed by the respondent.

There is no research investigating whether self-administered surveys in different languages produce statistically different results. Further, there is no research to date on whether multiple language surveys administered in developing countries have an impact on willingness to pay values. This research will examine if there is a statistical difference among tourists' responses from a self-administered survey in English versus Spanish in a developing country.

3.2.3: Nonmarket Valuation Analysis of Tourists Who Purchase Tour Packages

Tour packages bundle common trip attributes including transportation, accommodation, sightseeing, meals and other items into a single product or marketed experience which is sold at a single undifferentiated price. The consumer purchases the tour package in advance from tour operators, tour wholesalers or retail travel agents whom are based in areas other than the tourist's destination. Tour packages take some uncertainty, lack of information and anxiety out of tourism planning. As a result, tour packages are purchased more often for international trips rather than domestic trips, for example (Mak, 2004). Independent travelers, tourists who do not purchase tour packages, must arrange for their own transportation, accommodations and meals and hence may spend their tourism budget in different locations than a tour purchaser does. In addition, travelers who purchase tours may differ significantly from independent travelers in terms of demographics, total trip expenditures and other important trip attributes including length of stay and mix of experiences demanded. Tour quality and the tourist's perception of the tour's value for the dollar will be reflected in the visitor's perception of the tourist destination (Hanefors and Larsson Mossberg, 1999). As a result, tourists who travel through a tour package may lead to different tourism impacts on a local economy, relative to independent travelers (Mak, 2004).

To date there have been no known economic studies which have analyzed the impacts of tour packages on tourism expenditures and local economic impact. The objective of this research is to evaluate the tourists' demographics, trip characteristics,

68

travel expenditures and trip values of individuals who purchase a tour package as compared to those who travel independently.

3.3: Methodology

3.3.1: Data Collection

In order to capture the tourists' attitudes, travel behavior, expenditures and values towards the El Calafate region and Glaciers National Park, a 15 minute, in-person, intercept survey was administered. Willing, adult, non-residents of El Calafate (as established through a series of filter questions) were surveyed by employees of the State of Santa Cruz Department of Tourism and of the Foundation for the Future of Nature (Appendix IIIB: Scenic Roadway, Argentina Survey – English Version). The surveys were completed in the town of El Calafate and at the entrance to the Park in March and April, 2005.

This analysis is based on 390 useable surveys, although not all respondents provided information for all questions. An accurate count of refusals was not kept, but it is not believed that omitting the opinions of the refusals systematically skewed the results. The overwhelming reason for refusing to complete the survey was "not enough time," rather than strong objection to either the instrument or the subject matter of the study.

3.3.2: Survey Format

The survey was presented in four sections: features of enjoyment of the trip; trip expenditures; sensitivity to change in environmental quality and tourism costs; and

demographics. In the valuation portion of the survey respondents were provided three pairs of images depicting the current (undeveloped) state of the roadway next to one of three potential development scenarios. Using Adobe Photoshop software, Scenario I placed overhead electric wires, typical of the region, into the baseline. Scenario II introduced rock quarries, common in the region for roadway construction materials, into the viewscape. Scenario III included both forms of infrastructure development (Appendix IIIC: Valuation Scenarios). Other innovations in the survey instrument included the ability to complete the survey in either English or Spanish and to provide values in Euros, US Dollars, or Argentine Pesos, all at the choice of the respondent. The survey translation followed appropriate protocols, beginning in English, then translating to Argentine Spanish, then back translated to English again, in order to improve consistency of message. In addition, the instrument was designed to facilitate understanding the effect of package tours on the local economic contribution of tourism expenditures, an issue of particular concern in remote regions.

3.3.3: Model Specification and Hypotheses

In this study, contingent behavior and contingent valuation models are employed. The contingent behavior portion of the survey inquires whether or not the respondents would travel to El Calafate if development along the road to Perito Moreno Glacier occurred as displayed in the three pictorial scenarios. Since the contingent behavior question is a dichotomous choice format, a logit model will be employed to evaluate the contingent behavior model for each of the three development scenarios (Champ *et al.,* 2003).

70

The contingent valuation portion of the survey is similar to that of the contingent behavior portion as it asks a contingent valuation question for each of the three development scenarios. Specifically, respondents are asked to give the maximum value they would be willing to pay for each round trip from El Calafate to Perito Moreno Glacier to avoid seeing the development portrayed in each of the three pictures. The respondents were allowed to choose their maximum willingness to pay from an open ended payment card response format. Since the dollar values need to be positive, a single bounded tobit model will be utilized for the evaluation of the contingent valuation models (Champ *et al.,* 2003). A series of follow up questions were asked to establish whether a zero bid was indicative of a positive value for the more developed view, a protest or a property rights/public choice versus social planner perspective on the role of government in private lands management.

In general, it is hypothesized that people with higher incomes, who travel greater distances, are more educated, are older, and travel independently will spend more money in the local economy. It is further hypothesized that these people will be willing to pay more to avoid the infrastructural development which will adversely affect the scenic viewscape from the roadway and that these people will be less sensitive to changes in travel costs (Mowforth and Munt, 2003)

For the contingent behavior and contingent valuation survey questions, three digitally altered pictures of differing levels of development were used. The first two pictures show two different forms of development while the last picture shows a combination of infrastructure development of the previous two pictures. The null hypothesis is that the contingent behavior and contingent valuation responses are

71

independent of the corresponding development scenario. The contingent behavior null hypothesis for both valuation techniques is as follows:

$$H_0: \beta_{Scenario\ I} = \beta_{Scenario\ II} = \beta_{Scenario\ III}$$

The analysis and testing of the three development scenarios for the contingent behavior question will be separate from the contingent valuation analysis. For each valuation technique, three different models are constructed and pairwise t-tests comparing the equality among the regressions are evaluated. Due to multicollinearity issues among the scenarios, a pooled model cannot be constructed. Multicollinearity occurs when a "perfect" or exact linear relationship among some of the explanatory variables exists (Gujarati, 2003). In the case of this model, the multicollinearity exists among the "yes" and maximum willingness to pay responses among the scenarios. If a respondent stated that they would still have visited El Calafate if the road to Perito Moreno Glacier were developed as shown in Scenario III, in most cases, responded similarly to the development shown in Scenarios I and II. In addition, the respondents' maximum willingness to pay across scenarios was highly correlated with each other (at least 0.90). If the multicollinearity issue were to be ignored, the regression coefficients, although determinate, would possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy (Gujarati, 2003). Therefore, a comparative analysis of significance between models, such as the likelihood ratio test, cannot be conducted (Greene, 2003).

The pairwise t-test is used to test for significance across coefficients between the three models (i.e. Scenario I vs. Scenario II; Scenario II vs. Scenario III; Scenario I vs.

72

Scenario III) (Stephenson, undated). For example, the equation for the t-test to compare the significance between Scenario I and Scenario II is as follows:

$$SE(\beta_I - \beta_{II}) = S_P\sqrt{[(1/n_I) + (1/n_{II})]} \tag{1}$$

It is, essentially, the standard error between the two coefficients, where n is the number of observations for each sample and β is the coefficient value of an independent variable for each sample. The pooled standard error, denoted as S_P, is calculated as follows:

$$S_P = \sqrt{\{[(n_I-1)*S_I^2 + (n_{II}-1)*S_{II}^2] / (n_I + n_{II} - 2)\}} \tag{2}$$

Where, S^2 is the variance of the coefficient for the Scenario I regression and the Scenario II regression, respectively. The pairwise t-test is a two-tailed hypothesis test; therefore, the decision rule for rejecting the null hypothesis is if the absolute value of the calculated t-statistic is greater than the critical t-statistic, given the degrees of freedom (Gujarati, 2003).

The survey was administered in both English and Spanish in order to capture a more representative sample of the tourist population to the El Calafate region. Survey elicitation language in combination with country of origin information serves as a proxy for culture. Since the majority of the respondents who speak Spanish are Argentine, while the surveys in English were completed by respondents who traveled from foreign countries, it is hypothesized that their perceptions of development along the scenic roadway may be significantly different. The general null hypothesis is that the survey responses will be independent of the language of the survey. Specifically, the null hypothesis is that the survey elicitation language is independent of the tourists' responses, as follows:

$$H_0: \beta_{Language} = 0$$

73

this will be tested across all development scenarios for both the contingent behavior and contingent valuation models.

Since tour packages are purchased from a tour company based outside of the tourist's destination, it is hypothesized that tourists who travel on a tour package will have differing economic impacts to the local economy compared to tourists who travel independently. The null hypothesis is that survey responses are not statistically different from tourists who purchase a tour package compared to tourists who travel independently, as follows:

$$H_0: \beta_{Tour\,Pckg} = 0$$

This hypothesis will also be tested across all development scenarios for both the contingent behavior and contingent valuation models.

In order to test the survey elicitation language and the tour package purchase hypotheses, dummy variables were created. The dummy variables are incorporated into the estimation models for both valuation techniques across all development scenarios. The statistical significance of the language and tour package coefficients are tested by examining the corresponding probability values for each coefficient. If the probability value is less than 0.10, then the coefficient is statistically significant at the 90% level. If the probability value is less than 0.05, then the coefficient is statistically significant at the 95% level. If the probability value is than 0.01, then the coefficient is statistically significant at the 99% level.

The contingent behavior model used to test the hypothesis is the following:

$$VISIT = \beta_0 + \beta_1 LANGUAGE + \beta_2 TOURPCKG + \beta_3 SATISFEC + \beta_4 GENDER +$$
$$\beta_5 AGE + \beta_6 ARGIE + \beta_7 EDUC + \beta_8 INCPROP \qquad (3)$$

74

and the contingent valuation model is the following:

$$WTPUSD = \beta_0 + \beta_1 LANGUAGE + \beta_2 TOURPCKG + \beta_3 SATISFEC +$$

$$\beta_4 GENDER + \beta_5 AGE + \beta_6 ARGIE + \beta_7 EDUC + \beta_8 INCPROP \quad (4)$$

for each of the three development scenarios. A list of the variables utilized for this

evaluation can be seen in Table 3.1.

Table 3.1: Variable Description

Variable	Description
VISIT	Dummy Variable: 1=Would have still visited El Calafate if the road were developed as shown in each of the three scenarios, 0=Otherwise
WTPUSD	Maximum willingness to pay (normalized to US Dollars) for each round trip from El Calafate to Perito Moreno Glacier to AVOID seeing the development as shown in each of the three scenarios.
LANGUAGE	Dummy Variable: 1=Survey administered in Spanish, 0=Survey administered in English
TOURPCKG	Dummy Variable: 1=Traveled with a tour package, 0=Traveled without a tour package
SATISFEC	General level of satisfaction with the respondents' stay in the El Calafate area (5 = Completely satisfied, 1 = Not at all satisfied)
GENDER	Dummy Variable: 1=Male, 0=Female
AGE	Age of the respondent, in years
ARGIE	Dummy Variable: 1=Argentine visitor, 0=Foreign visitor
EDUC	Highest level of formal education in years
USDXPERD	Expenditures per person per trip day (normalized to US Dollars)
USDSALAR	Annual Household Income normalized to US Dollars; ranging from $1,667 to $182,467
INCPROP	Proportion of total annual household income spent on respondent's trip to El Calafate in thousands of dollars (USDXPERD/USDSALAR)

There are nine independent variables used to estimate the contingent behavior

(VISIT) and contingent valuation (WTPUSD) models. Traditionally, the country of origin

was used as a proxy of culture. However, in this research we have the country of origin

variable (ARGIE) plus the respondents' predominant language (LANGUAGE) for a

better estimation of the proxy of culture. In order to determine the language the

respondent completed the survey, a dummy variable (LANGUAGE) was created where 1

75

represented if the survey was administered in Spanish and 0 represented if the survey was completed in English. For the tour package purchase (TOURPCKG), a dummy variable was constructed where 1 meant the visitor traveled via a tour package and 0 indicated that the visitor traveled independently. The general satisfaction of the respondents' stay in El Calafate was captured with a variable (SATISFEC) derived from a Likert scale where 1 represented the respondent was not at all satisfied with their stay and 5 indicated the respondent was completely satisfied with their stay. A few demographic variables were included in the models, such as the gender (GENDER), age (AGE) and the highest educational level (EDUC) achieved by the respondent. In order to capture the expenditure patterns of the respondent, a variable indicating the daily trip expenditures per person (USDXPERD) and a variable representing the gross annual household income (USDSALAR) were included in the contingent behavior and contingent valuation econometric models. Specifically, a variable was created in order to capture the proportion of total annual household income spent on the trip to El Calafate (INCPROP).

3.4: Descriptive Analysis

3.4.1: Demographics

Just less than one half (46%) of survey respondents were from Argentina and almost 80% of travelers to the region were fluent Spanish speakers, regardless of nationality. About 13% of visitors were from Spain and almost 7% came from Uruguay. English was the most common language spoken other than Spanish, accounting for about 2 of every 3 respondents (Table 3.2).

Table 3.2 Nationalities and Language of Visitors to El Calafate	
Nationality	**Percentage (%)**
Argentina	46.4
Spain	13.2
Uruguay	6.6
France, United States	3.6
Mexico	3.1
Languages spoken fluently	
Spanish	79.3
English	61.7
French	16.6
Italian, German, Portuguese, others	<10

Approximately, 3 of 4 respondents chose to take the survey in Spanish. Nearly all Argentines elected to take the survey in Spanish, regardless of whether they had purchased a tour package. Almost half of foreigners took the survey in English. About 2/3 of foreigners who purchased a tour took the survey in Spanish, while about 3/5 of foreigners who did not purchase a tour elected to take the survey in English (Table 3.3).

About 55% of all respondents were male. The gender of visitors varied substantially by country of origin and the decision to purchase a tour package. Slightly more than half of Argentine visitors were female, while 60% of foreign visitors were male. About 60% of Argentines choosing to purchase tours were female, while only about 1/3 of foreigners choosing to purchase tours were female. Males made up a similar proportion of all visitors, regardless of nationality, choosing not to purchase a tour (about 55%). Unlike Argentines, there are more male foreign visitors relative to female foreign visitors. Among Argentines, women make up a greater proportion of tour purchases, while among foreigners, men purchase more tours. The gender balance is similar across nationalities among those who do not purchase tours. The average age of survey

77

respondents was approximately 40 yrs old. Argentines were slightly (1 yr) older than the mean, while Foreigners were slightly (1 yr) younger than the mean. Those who chose to purchase a tour were somewhat older (2.5 yrs) than the mean regardless of nationality. Foreigners who did not purchase a tour were substantially younger (>5 yrs) than the mean respondent (Table 3.3).

The median amount of paid vacation does not vary across categories, establishing a one month per year standard. However, the mean does vary systematically, indicating that Argentines have somewhat less vacation time on average than their foreign counterparts. Argentines that purchase tours are more likely to have somewhat less vacation time relative to Argentines who do not purchase tours. On the other hand, foreigners who purchase tours are likely to have slightly more paid vacation time than those who do not (Table 3.3).

Table 3.3: Descriptive Survey Responses Information

	Spanish Survey	Male	Age		Paid Vacation
	%	%	Mean	Median	Weeks/yr
Total	74	55	39.84	38.00	4.13
Argentines	98	48	40.95	42.00	3.81
Argentines - Tour	98	41	42.38	44.00	3.63
Argentines - No Tour	98	54	39.90	39.00	3.96
Foreigners	53	61	38.82	35.00	4.41
Foreigners - Tour	66	65	42.24	42.50	4.50
Foreigners - No Tour	39	55	34.96	30.50	4.30

Overall, there are three people in respondents' households. Argentine households appear to be somewhat larger than foreign visitors' households on average. Argentines who purchase tours have somewhat smaller households than Argentines who do not, while, like paid vacations, the opposite is true of foreigners. One or two people typically

78

contribute to household income across all groups. There is no variation across Argentine visitors' households. Foreign visitors demonstrate somewhat lower values (*i.e.* number in household, income earners and household income) across categories and foreigners who purchase tours have the fewest sources of income across all categories by a small measure (Table 3.4).

Pre-tax household income differs substantially between Argentine and foreign visitors. Responses provided in Euros were converted at a rate of 0.77 Euros to 1 US Dollar and Argentine Pesos (AP) were converted at a rate of 3 AP to 1 US Dollar. On average, foreign visitors earn four times their Argentine counterparts using either the median (eliminating the influence of extreme outliers) or the mean measures. In both cases, those who purchase tours have a higher household income than those who do not purchase tours. The differences are more pronounced (in both absolute and percentage terms) among Argentine visitors than among foreigners using mean values (Table 3.4).

Table 3.4: Respondents' Household Features

	Number in Household		Income earners	Household Income (US Dollars, 2005)	
	Mean	Median	Mean	Mean	Median
Total	3.08	3	1.83	$40,631	$25,000
Argentines	3.36	3	1.93	$15,424	$11,667
Argentines - Tour	3.26	3	1.93	$16,938	$11,667
Argentines - No Tour	3.43	3	1.93	$14,242	$11,667
Foreigners	2.82	2	1.73	$62,936	$46,667
Foreigners - Tour	2.93	3	1.69	$63,625	$50,833
Foreigners - No Tour	2.69	2	1.79	$62,067	$46,667

The median education level does not vary across categories. However, the mean does vary systematically, indicating that Argentine tourists are somewhat less educated than foreign visitors on average. This implies that there are fewer very highly educated

visitors among Argentines or fewer very poorly formally educated foreigners among respondents relative to their counterparts. Those who purchase tours, regardless of nationality, appear to be slightly more educated (Table 3.5).

Table 3.5: Respondents' Level of Education

	Total	Argentine			Foreigner		
		Overall	Tour	No Tour	Overall	Tour	No Tour
N	*386*	*188*	*81*	*107*	*198*	*105*	*93*
Primary	1.3%	2.7%	1.2%	3.7%	0.0%	0.0%	0.0%
Secondary	17.4%	21.8%	14.8%	27.1%	13.1%	10.5%	16.1%
Tertiary	12.7%	20.7%	27.2%	15.9%	5.1%	6.7%	3.2%
Technical School	3.1%	2.7%	3.7%	1.9%	3.5%	3.8%	3.2%
University	50.5%	46.8%	50.6%	43.9%	54.0%	58.1%	49.5%
Grad, Post-Grad or Prof School	15.0%	5.3%	2.5%	7.5%	24.2%	21.0%	28.0%

3.4.2: Trip Characteristics

Most people travel to El Calafate as a pair or in groups of three people. Those who do not purchase tours travel in similarly small groups regardless of nationality. Tour purchasers, particularly foreigners, travel in substantially larger groups, about double the size of those who do not purchase tours (Table 3.6). Travel patterns vary substantially within and across nationalities and tour purchases. There is some evidence of a "typical" trip to the region, but also a great deal of variation on the typical trip. Argentines tend to travel to the El Calafate region as a single destination trip, spending 1-3 days traveling to and from the region and spending approximately 3-4 days in the region. Foreigners tend to travel for substantially longer periods of time and linger somewhat longer in the El Calafate region. Tour purchasers tend to spend about 3-3.5 days in the region while those who do not purchase tours spend 4-5 days. Foreigners who do not purchase tours are on

80

substantially longer trips (a month or more) than those who do purchase tours (two to

three weeks) (Table 3.6).

Table 3.6: Trip Features

	Days on trip		Days in Argentina		Days in El Calafate		Number in group	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Total	28.11	8	12.47	8	4.04	4	4.23	2
Argentines	7.6	4	5.51	4	3.73	4	3.93	2
Tour	5.85	4	5.77	4	3.51	4	4.7	2
No Tour	8.94	4	5.33	4	3.9	4	3.34	3
Foreigners	47.49	15	18.03	14	4.32	3	4.51	2
Tour	17.93	12	13.41	11.5	3.65	3	5.56	3
No Tour	80.23	25	22.86	15	5.04	4	3.36	2

The majority (82% overall; 71% of Argentines; 93% of foreigners) of visitors to

the El Calafate region were on their first trip to the area. Argentines (29%), particularly

those who did not choose to purchase tours (43%), were more likely to have visited the

area previously. Multiple time visitors to the region rarely purchase tours (Table 3.7).

Table 3.7: Number of Times Having Visited El Calafate/ Glaciers National Park

	N	Mean	Median
Total	392	1.36	1.00
Argentines	188	1.62	1.00
Argentines - Tour	81	1.17	1.00
Argentines - No Tour	107	1.96	1.00
Foreigners	203	1.12	1.00
Foreigners - Tour	106	1.06	1.00
Foreigners - No Tour	97	1.20	1.00

Visitors to the El Calafate region generally would have liked to have stayed

longer than they did by about 1-2 days. Argentines and foreigners who purchased tours

would have chosen to stay the least additional amount of time in the region which

equated to about 1 ¼ days. Foreigners who did not purchase a tour package would have

remained an additional 1¾ days, while Argentines without package tours would have

stayed more than two additional days each on average (Table 3.8). This difference of one

81

day's stay may create a substantial difference in expenditures in the local economy, which may be compounded by the differences in daily expenditure patterns between those who purchase and those who do not purchase tour packages.

Table 3.8: Additional (or Fewer) Nights Respondents' Would Have Stayed in El Calafate if He/She Could Plan His/Her Trip Again

	N	Mean	Median
Total	383	1.58	1.00
Argentines	181	1.71	1.00
Argentines – Tour	80	1.18	1.00
Argentines - No Tour	101	2.14	1.50
Foreigners	201	1.47	1.00
Foreigners – Tour	106	1.25	1.00
Foreigners - No Tour	95	1.73	1.00

Across all visitors, the most important feature of a trip to El Calafate and Glaciers National Park is to see the glaciers and iceflows. The least important features in a visit to the region are its high quality lodging, hunting and fishing opportunities, communication infrastructure, and nightlife and entertainment offerings. The availability of high quality lodging is more important to those who chose to purchase package tours. The contact with nature and mountain landscapes is more important to those who did not purchase package tours relative to those who did travel to the region with a tour package. Table 3.9 displays the mean importance values of natural and human attributes and activities in the tourists' decisions to visit El Calafate. The scaling factors were as follows: 5 = Very Important, 3 = Neutral and 1 = Irrelevant (Very Unimportant).

82

Table 3.9: The Importance of Natural and Human Attributes and Activities in Tourists' Decisions to Visit El Calafate

	Importance to the Visit to El Calafate, Argentina				
	Total	**Argentine, With Tour**	**Argentine, No Tour**	**Foreigner, With Tour**	**Foreigner, No Tour**
Lakes and Rivers	4	4	4	4	4
Glaciers/ Iceflows	5	5	5	5	5
Viewing Wildlife (flora and fauna)	4	4	4	4	4
Mountain Landscapes	4	4	5	4	4
Outdoor Recreation Opportunities (trekking, hiking, running, climbing, etc) NOT hunting and fishing	4	4	4	4	4
Hunting and Fishing	2	2	2	2	2
Photography	4	4	4	4	4
Cleanliness or Lack of Pollution	4	4	4	4	4
Solitude or Lack of Crowds	4	4	4	4	4
Contact with Nature	4	4	5	4	4
Entertainment or Nightlife	2	2	2	2	2
Communication/ Transportation Infrastructure (e.g. Internet, roads, phones)	3	3	4	3	3
High Quality Lodging	3	4	3	4	3
Reasonable Prices	4	4	4	4	4

3.4.3: Expenditure patterns

Total trip expenditures and local economic impact vary in three significant ways. First, total trip expenditures may reflect visits to multiple destinations, so all expenditures clearly cannot be included in either valuation or economic impact assessments. Secondly, some expenditures do not take place locally, such as plane tickets and tour packages. As a result, they should be included in economic valuation estimates when attributable to El Calafate, but not in local economic impact estimates. In addition, local economic impact includes not only direct expenditures, but also local multiplier effects throughout the

83

local economy. In this study, total trip expenditures and local direct expenditures are

evaluated.

Total trip expenditures, including tour packages and other expenditures outside of

the region averaged $3,238, with Argentines spending about 1/3 of that total on average

and foreigners spending about 1½ times the average (Table 3.10). An enormous (6-fold)

difference in average expenditures between foreigners who do and do not purchase tours

is reported. Foreigners, who purchased tours, potentially including other destinations,

spent about 3 ½ times their Argentine counterparts. Argentines who did not purchase

tours report total trip costs of about 1/3 that of Argentine tourists who did purchase tours.

Table 3.10: Total Trip Expenses (US Dollars, 2005)

	Total		Per day		Per Person		Per person-day	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Total	$ 3,238	$ 1,233	$ 1,121	$ 310	$ 1,472	$ 667	$ 428	$ 189
Argentines	$ 1,248	$ 775	$ 405	$ 228	$ 630	$ 500	$ 198	$ 125
Tour	$ 1,884	$ 1,465	$ 645	$ 479	$ 985	$ 991	$ 331	$ 278
No Tour	$ 673	$ 473	$ 177	$ 125	$ 308	$ 226	$ 76	$ 62
Foreigners	$ 5,079	$ 2,100	$ 1,741	$ 567	$ 2,251	$ 1,175	$ 629	$ 328
Tour	$ 7,940	$ 4,120	$ 2,808	$ 1,154	$ 3,216	$ 2,778	$ 923	$ 694
No Tour	$ 1,251	$ 466	$ 371	$ 138	$ 960	$ 349	$ 268	$ 91

For their trip to the El Calafate region 43.4% of Argentines and 52.7% of

foreigners purchased package tours. Tours including El Calafate averaged a bit over a

week in duration. However, the tours that foreigners purchased tended to be longer than

those purchased by Argentines by about 6 days (*i.e.*, 10-12 days vs. 4-6 days). Argentines

spent $667 for their tour on average. On average, foreign visitors spent 2½ to 3½ times as

much as Argentines on their tour packages, with some spending a great deal more (Table

3.11).

Table 3.11: Tour Characteristics (US Dollars, 2005)

		Total	Argentines	Foreigners
Days on tour	Mean	9.15	5.51	11.93
	Median	7.0	4.0	10.0
	N	167	71	95
Total cost of tour	Mean	$1,836	$751	$2,657
(Argentine Pesos, 2005)	Median	$1,000	$667	$1,800
	N	184	78	105

Excluding tour purchases, the average tourist expenditure in the El Calafate region was $525 (or $159 per day) and the median expenditure is about half that amount. However, there is substantial variation in expenditures across groups. Foreigners spent about $400 per trip more than Argentines on average. Foreigners without tours spent more than two times the average Argentine visitor and about 75% more than Argentines who did not purchase tours. Foreigners without packages spent about $1,200 per trip and more than $330 per day in the El Calafate region, while Argentines with pre-purchased packages spend only about 40% of these amounts in the region. Independent travelers from Argentina and foreigners with pre-purchased packages spend similar amounts to one another, depending on whether the mean or median is used, averaging about 2/3 of independent foreign travelers (Table 3.12).

Mean and median expenditures per day vary substantially, particularly among foreigners, indicating that there are a few individuals on very high-end vacations. Mean expenditures for foreigners are almost twice that of Argentines regardless of whether they are tour purchasers, while median expenditures for foreigners are only slightly higher than that of Argentines. Tour purchasers spend about 30-40% less per day than non tour purchasers. Differences in expenditures per person-day between Argentines and foreigners are even more pronounced, as Argentines are more likely to travel in

85

somewhat larger groups relative to foreigners (Table 3.12). On average, foreigners spend

about 2.5 times more per person than do Argentines, due to a few high-end foreigners.

Using the median, expenditures of foreigners relative to Argentines are quite similar,

although foreigners demonstrate greater distinctions between tour purchasers and non-

tour purchasers than do Argentines (Table 3.12).

Table 3.12: Non-tour Trip Expenses (US Dollars, 2005)

	Total		Per day		Per Person		Per Person-day	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Total	$ 819	$ 405	$ 250	$ 111	$ 525	$ 231	$ 159	$ 63
Argentines	$ 585	$ 397	$ 162	$ 105	$ 293	$ 213	$ 77	$ 57
Tour	$ 460	$ 307	$ 142	$ 83	$ 271	$ 207	$ 79	$ 53
No Tour	$ 673	$ 473	$ 177	$ 125	$ 308	$ 226	$ 76	$ 62
Foreigners	$ 1,047	$ 420	$ 329	$ 115	$ 751	$ 242	$ 232	$ 70
Tour	$ 840	$ 345	$ 285	$ 103	$ 539	$ 180	$ 195	$ 56
No Tour	$ 1,251	$ 466	$ 371	$ 138	$ 960	$ 349	$ 268	$ 91

Transportation, lodging and tours were the most common features in tours

purchased by visitors to the El Calafate region. Transportation to El Calafate, local

transportation and lodging during their stay were substantially (about 10%) more

common among tour purchases of foreigners relative to Argentines (Table 3.13).

Table 3.13: Percent of Respondents Who Purchased a Tour Package Who Had
the Following Included in their Tour Package Expenses

	Total	Argentine	Foreigner
N	184	79	106
Transport to El Calafate	60.3%	53.2%	65.1%
Transport in El Calafate	53.3%	46.8%	57.5%
Lodging	62.0%	55.7%	66.0%
Food & beverages	15.8%	8.9%	20.8%
Tours/excursions, including guides	46.2%	43.0%	48.1%
Souvenirs/gifts	4.3%	1.3%	6.6%
Entry fees and licenses	23.4%	10.1%	33.0%
Equipment rental	4.9%	1.3%	7.5%

86

Transportation costs constitute an important part of travel costs to the El Calafate region. Most travel costs incurred by tourists are not expended in the region and so the benefits of those expenditures do not tend to accrue to the region. Visitors who purchase tours spend substantially (5 to 10 times) less on transportation to the region than do those who do not purchase tours. Potentially, tour purchasers travel by bus, whereas Argentines would be more likely to arrive by private car and foreigners may show a higher propensity to arrive to the region by airplane (Table 3.14).

On average, Argentines and foreigners spend similarly on local transportation, around $22 over their 3-4 day stay in the region. However, stark differences are reported by those who purchase tours and those who do not, providing additional insights into transportation expenditures. Argentines who purchase tours spend half as much on local transportation as those who do not purchase tours. Foreigners who purchase tours spend very little indeed on local transportation, while foreigners who do not purchase tours spend about twice the overall average and ten times what tour purchasers spend on local transportation (Table 3.14).

The average visitor spends about $50 on lodging during their 3-4 day visit to the El Calafate region. Independent travelers spend the most on lodging, regardless of their nationality, averaging around $85-$90 over 3-4 nights. The data reflect that food and beverage purchases are at least as important a budget item as lodging for travelers to the region. Foreigners spend about twice as much as Argentines on food and drink. Interestingly, people who purchase tours spend about 25-30% more on food and drink than those without tour packages (Table 3.14).

87

Expenditures on local tours and excursions were quite consistent across categories at around $56. Foreigners who had not purchased broader tour packages to the region, spent somewhat more in this category, while foreigners who did purchase tour packages spent somewhat less as local excursions were likely included in their overall tour package. Generally, the data indicate that somewhat more was spent on local excursions than on lodging (Table 3.14). Reported expenditures on souvenirs and gifts were quite consistent across all categories except foreigners who purchased tours. All Argentines and foreigners without tours spent around $17-$23 on souvenirs, while foreigners on tours spent six times that amount, more than they spent on any other expenditure category (Table 3.14).

Entry fees and licenses constitute a relatively minor part of total trip expenditures. Foreigners spend some three times more than Argentines on entry fees. Travelers, particularly Argentines, spent almost nothing on equipment rentals such as bicycles or climbing gear, for example. Foreigners who did not purchase a tour were the only group reporting significant expenditures in this category, averaging only about $3 (Table 3.14).

Table 3.14: Non-tour Travel Expenditures (2005)

	Transport to El Calafate	Transport in El Calafate	Lodging	Food & bev.	Tours	Gifts	Entry fees/ licenses	Equip. Rental	Other
Total	$162	$22	$51	$68	$56	$52	$10	$1	$2
Argentines	$79	$22	$60	$43	$55	$19	$5	$0	$3
Tour	$24	$13	$22	$49	$55	$16	$4	$0	$1
No Tour	$122	$29	$89	$38	$56	$21	$6	$0	$4
Foreigners	$240	$21	$43	$91	$57	$82	$14	$2	$1
Tour	$38	$5	$5	$111	$49	$136	$16	$0	$0
No Tour	$463	$38	$84	$68	$65	$23	$12	$3	$2

88

3.4.4: Scenic Value and Economic Impact

Travelers were asked to assess at what increase in costs they would no longer choose to visit the El Calafate-Glaciers National Park region. Overall, respondents were willing to tolerate up to a $171 increase in costs due to hypothetical increases in fuel costs, taxes, or other travel costs and still visit the region. Here again, there is substantial variation across subgroups, with Argentines willing to pay substantially (5-6 times) less than foreigners and independent travelers willing to pay substantially ($50) more than those who pre-purchased package tours (Table 3.15). Median responses were substantially lower than mean responses across categories. Interestingly, the median response for Argentines, and therefore overall, was zero which may reflect their actual willingness to pay or sensitivity to changes in travel costs.

Table 3.15: Maximum Increase in Costs (Willingness to Pay) to Visit El Calafate/ Glaciers National Park

	N	Mean	Median
Total	338	$ 171	$ 3
Argentines	169	$ 64	$ 0
Argentines - Tour	74	$ 38	$ 0
Argentines - No Tour	95	$ 85	$ 0
Foreigners	169	$ 278	$ 17
Foreigners - Tour	88	$ 269	$ 17
Foreigners - No Tour	81	$ 288	$ 10

Respondents were asked to evaluate three development scenarios on two criteria; whether or not they would still visit if the development/change occurred and what would be their maximum willingness to pay to avoid the change. The change/development in Scenario I was the construction of overhead electric cables and associated infrastructure. Scenario II imposed rock quarries along the roadway to provide convenient road

89

construction materials. Scenario III consists of both electric cables and quarries. In each case respondents were asked to compare the development scenario to the current, undeveloped, case. (Appendix IIIC: Valuation Scenarios). It is hypothesized that people will be less willing to visit due to the infrastructural development and be willing to pay to avoid the development relative to the current state. Survey responses regarding the importance of various aspects of the tourist experience would seem to provide some support for this hypothesis. Further, we hypothesize that the combination of the two development options will result in stronger responses than in each case.

In development Scenario I, respondents were asked to compare an undeveloped or status quo photograph against the same photo, but with electric infrastructure typical of the region imposed on the status quo case. Overall, some 18% of respondents indicated that they would not choose to visit the region if the electric lines were in place. Argentines were somewhat more sensitive to this type of development than were foreigners (19% vs. 16%) and those who purchased tours were more sensitive than those who did not (Table 3.16).

Respondents were substantially less likely to recommend the region as a vacation destination under development than they were to actually visit themselves. Overall, 29% of respondents indicated that they would not recommend the region to friends and neighbors if electric infrastructure were in place along the roadway. Again, Argentines were more sensitive to this type of development than were foreigners (29% vs. 28%) (Table 3.16).

90

Table 3.16: Respondent Would Visit or Recommend Region As Vacation Destination If the Roadway Were Developed Shown (Proportion 'yes')

	Scenario 1		Scenario 2		Scenario 3	
	Visit	Recommend	Visit	Recommend	Visit	Recommend
Total	0.83	0.71	0.75	0.62	0.65	0.55
Argentines	0.81	0.71	0.76	0.67	0.65	0.56
Tour	0.78	0.66	0.72	0.63	0.62	0.54
No Tour	0.84	0.74	0.80	0.70	0.68	0.58
Foreigners	0.84	0.72	0.74	0.58	0.64	0.55
Tour	0.82	0.73	0.76	0.60	0.67	0.56
No Tour	0.85	0.71	0.73	0.55	0.61	0.53

On average all respondents indicated a per trip willingness to pay of $15 to avoid the electric infrastructure development. This provides a measure of the value of the unimpeded viewscape relative to one with electric cables in it. Foreigners' willingness to pay to avoid the development was substantially (3-6 times) greater than Argentines. Consistent with the dichotomous choice responses, those who purchased tours were willing to pay about twice those who did not purchase tours in order to avoid the electric infrastructure development (Table 3.17).

Table 3.17: The Maximum Respondent is Willing To Pay For Each Round Trip From El Calafate to Perito Moreno Glacier to AVOID Seeing the Development Shown

	Scenario 1		Scenario 2		Scenario 3	
	Mean	Median	Mean	Median	Mean	Median
Total	$ 15	$ 0	$ 15	$ 0	$ 18	$ 0
Argentines	$ 8	$ 0	$ 7	$ 0	$ 9	$ 0
Argentines - Tour	$ 11	$ 0	$ 10	$ 0	$ 11	$ 0
Argentines - No Tour	$ 5	$ 0	$ 5	$ 0	$ 7	$ 0
Foreigners	$ 22	$ 2	$ 22	$ 1	$ 27	$ 1
Foreigners - Tour	$ 27	$ 3	$ 26	$ 5	$ 31	$ 5
Foreigners - No Tour	$ 16	$ 0	$ 18	$ 0	$ 22	$ 0

Scenario II consists of construction materials (*i.e.* gravel pits), fairly common in the region, along the roadway. Respondents were generally more opposed to this sort of development than to electric infrastructure with some 25% indicating they would not choose to visit the region under these conditions. Foreigners were slightly stronger in their opposition to this development scenario than were Argentines (26% vs. 24%). Argentines who purchased tours were substantially more likely to be opposed to gravel pits in the viewscape than were those who did not purchase tours (29% vs. 20%), whereas foreigners demonstrated the opposite relative strength of protest (24% vs. 28%). Under the gravel pit scenario, again sentiments against recommending the region as a vacation destination were stronger than the intent to visit personally with some 37% of respondents indicating they would not recommend visiting under these conditions. Foreigners were substantially more vehement in opposition than Argentines (42% vs. 33%) and the tour versus no tour responses paralleled the visitation question for this scenario (Table 3.16).

Similarly, about one-fourth of the respondents indicated they would not visit if there were quarries along the roadway and on average respondents indicated they would pay about $15 to avoid the development. Here again, those who took tours were willing to pay more to avoid the development than those who did not purchase a tour. Foreigners, reflecting greater ability to pay and greater expenditures on their vacations to the region overall, were willing to pay roughly double the Argentines to avoid the development as shown (Table 3.16).

In Scenario III, the electric infrastructure was combined with the rock quarries and imposed on the undeveloped view. Our expectation that the combined effect should

be larger than either of the individual effects taken in isolation was upheld. Overall about 36% of visitors would not visit under the conditions presented in Scenario III. Consistent with the responses to our first two scenarios, respondents were stronger in the opposition to recommending the area to future visitors under this scenario than they were to visit themselves with 45% of respondents indicating they would not recommend visiting if gravel pits and electric infrastructure were in the viewscape (Table 3.16; Table 3.17).

The willingness to pay to avoid the combined infrastructure development scenario was greater than either of the individual effects, taken in isolation. On average, respondents were willing to pay about $18 per trip to avoid the development; foreigners were willing to pay about 2.5 times as much as Argentines ($26.39 vs. $8.85) and tour purchasers were willing to pay 30-40% more than non-purchasers (Table 3.17).

3.4.5: Impact Estimates

The total direct (not indirect or induced) economic effect of tourism to the El Calafate economy can be estimated by multiplying the average expenditure by class (Argentine or foreigner) by the number of visitors. In 2003, the most recent complete data available, at least 92,600 non-resident Argentines and 134,000 foreigners visited the Glaciers National Park (Table 3.18). The surveys were undertaken in March and April of 2005, when the number of non-resident Argentine and foreigner visitors is roughly equal historically. The proportion of Argentines to foreigners in our sample is quite similar to historic information, so a weighted average of impacts is not required. Subtracting transportation to El Calafate from non-tour expenditures, the mean estimated local expenditure per Argentine is $207, while the mean estimated local expenditure per

93

foreigner is $311. As a result, the total direct estimated impact of tourism visits to Glaciers National Park on El Calafate is $60,861,897 per year. Estimates of local tourism multipliers average approximately 1.40 (ICT, 2005). Using this multiplier, the total (direct + indirect + induced) estimated local economic impact is $85.2 million.

Estimates of tourists' willingness to pay to avoid the development scenarios provide a notion of the sort of resources that might be raised to offset any local financial losses due to leaving the roadway undeveloped. The total potential amount of money to be raised to offset these financial losses can be calculated by multiplying the number of visitors by the average willingness to pay to avoid each development scenario. The estimated willingness to pay to avoid electrical development is $3.7 million per year and to avoid quarries is also $3.6 million per year. The aggregate annual willingness to pay to avoid having both electrical infrastructure and quarries is $4.5 million. These numbers should be compared to the net benefits or costs of having the development to local people in the calculations for understanding the net benefits of having or not having the overhead electric wires and associated infrastructure along the scenic roadway.

94

Table 3.18: Visitation to Glaciers National Park, 2003

Month	Foreigners		Argentines		Residents		Unidentified		Total
January	17,035	40%	19,944	47%	5,347	13%	0	0%	42,326
February	15,888	43%	14,201	38%	2,511	7%	4,585	12%	37,185
March	11,842	37%	11,513	36%	1,704	5%	6,968	22%	32,027
April	7,255	36%	7,410	37%	1,425	7%	4,043	20%	20,133
May	2,235	27%	3,059	37%	474	6%	2,412	29%	8,180
June	1,033	35%	1,260	43%	203	7%	426	15%	2,922
July	2,051	38%	1,635	30%	492	9%	1,227	23%	5,405
August	4,210	53%	2,012	25%	599	8%	1,162	15%	7,983
September	6,442	46%	4,707	34%	667	5%	2,132	15%	13,948
October	15,987	50%	8,593	27%	1,341	4%	5,924	19%	31,845
November	25,761	56%	9,880	21%	987	2%	9,554	21%	46,182
December	24,325	56%	8,385	19%	1,913	4%	8,478	20%	43,101
Totals	*134,064*	*46%*	*92,599*	*32%*	*17,663*	*6%*	*46,911*	*16%*	*291,237*

SOURCE: National Park Service of Argentina, personal communication, 2005

It is possible that people who indicated that they were not willing to pay anything to preserve the relatively undeveloped nature of the roadway viewscape did so for any number of reasons, including that they hold no value in the view. It would be inappropriate, however, to ascribe zero value to all zero bids since people may be opposed to the proposed payment vehicle (toll or entrance fee), the presumed managing institution (government), or associate the developed view with other attributes (e.g., jobs, prosperity) that were not intended by survey vehicle. For example, those who provided a zero willingness to pay response for any of the scenarios were asked whether they preferred the developed view to the undeveloped view and 28% of these respondents (32% among Argentines and 23% among foreigners) indicated that they did. As it is difficult to believe that people actually prefer to see electric cables and gravel pits on the roadway, this response is viewed as either vote in favor of "development" or a protest

95

bid. By extension, 72%, even among those who were willing to pay nothing to preserve it, indicated they preferred the unfettered view.

Respondents were next asked a series of questions intended to address the strength of local private property rights and the role of government in land use planning. They were asked whether they felt landowners' property rights were essentially sacrosanct, indicating that they felt the government should not be involved in land management decisions. Next they were asked whether the government should use the regulatory tools available to it to manage land use. Finally, they were asked whether the government should use incentive based tools to manage land use.

The results are quite clear about property rights, but less clear about the government's use of tools to manage lands. Only 26% (29%, Argentines; 22% foreigners) of the zero willingness to pay respondents indicated that landowners should be able to develop their lands as they see fit, implying private property rights are bestowed on individuals by broader society with limitations. In addition, 93% (94% Argentines; 91% foreigners) of the zero willingness to pay respondents indicated support for regulatory solutions to preserve the view, implying a positive value for the undeveloped view, but an opposition to being asked to compensate for its provision, particularly among Argentines. However, when asked if compensatory tools should be used to preserve the landscape, some 78% of respondents (74% Argentines; 83% foreigners) who earlier indicated they were willing to pay nothing were in support of an incentive based approach, apparently with funds that are not raised from users of the roadway but rather from some other government revenue source (Table 3.19).

96

Table 3.19: Percent of Zero Willingness to Pay Respondents Who Answered 'yes' to the following questions

If you answered $0 WTP for any scenario...	Total	Argentine			Foreigner		
		Overall	Tour	No Tour	Overall	Tour	No Tour
Do you prefer the developed view?	27.8%	31.8%	33.3%	30.6%	23.4%	28.1%	20.0%
Do you feel landowners should be allowed to develop their lands?	25.6%	29.0%	21.8%	34.3%	22.4%	22.5%	22.3%
Do you believe the gov't should preserve the view using zoning etc?	92.6%	94.0%	91.0%	96.2%	91.2%	94.1%	88.0%
Do you feel the gov't should preserve the view by paying landowners or providing other incentives?	78.2%	73.5%	74.0%	73.1%	82.6%	85.1%	79.8%

3.5: Empirical Results

In order to test the hypotheses, six different econometric models were constructed, one for each development scenario under each valuation technique. In order to estimate the contingent behavior model, a logit regression was constructed for each development scenario which can be seen in Tables 3.20, 3.21 and 3.22. The dependent variable was whether (coded as 1) or not (coded as 0) the respondent would visit the Perito Moreno Glacier again with the level of development shown in each of the scenarios.

97

Table 3.20: Contingent Behavior Logit Regression for Development Scenario I

Variable	Coeff.	Std. Error	z-Stat.
CONSTANT	3.25	2.09	1.55
LANGUAGE	-1.46***	0.55	-2.69
TOURPCKG	-0.50E-02	0.36	-0.01
SATISFEC	-0.08	0.21	-0.40
GENDER	0.55*	0.34	1.61
AGE	0.01	0.01	0.95
ARGIE	0.28	0.39	0.73
EDUC	-0.08	0.11	-0.80
INCPROP	5.13	6.41	0.80
Log Likelihood			-114.30
Restricted Log Likelihood			-121.42
Chi Squared			14.22
Degrees of Freedom			8
Probability			0.08
Number of Observations			246

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 3.21: Contingent Behavior Logit Regression for Development Scenario II

Variable	Coeff.	Std. Error	z-Stat.
CONSTANT	-0.76	1.69	-0.45
LANGUAGE	-1.13***	0.45	-2.54
TOURPCKG	-0.07	0.32	-0.22
SATISFEC	0.11	0.19	0.57
GENDER	0.07	0.32	0.21
AGE	0.02*	0.01	1.91
ARGIE	0.46	0.36	1.28
EDUC	0.07	0.09	0.82
INCPROP	1.80	2.87	0.63
Log Likelihood			-132.13
Restricted Log Likelihood			-138.00
Chi Squared			11.74
Degrees of Freedom			8
Probability			0.16
Number of Observations			243

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

98

Table 3.22: Contingent Behavior Logit Regression for Development Scenario III

Variable	Coeff.	Std. Error	z-Stat.
CONSTANT	1.32	1.57	0.84
LANGUAGE	-0.35	0.37	-0.95
TOURPCKG	-0.58E-02	0.29	-0.02
SATISFEC	-0.02	0.17	-0.10
GENDER	0.16	0.29	0.55
AGE	0.01	0.01	0.95
ARGIE	0.23	0.33	0.69
EDUC	-0.06	0.08	-0.79
INCPROP	0.15	1.93	0.08
Log Likelihood			-153.78
Restricted Log Likelihood			-155.39
Chi Squared			3.22
Degrees of Freedom			8
Probability			0.92
Number of Observations			240

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

The survey elicitation language was statistically significant for the less developed scenarios (Scenario I and II) but not for the more developed scenario (Scenario III). If the respondent was given the survey in Spanish or if he or she purchased a tour package, they were less likely to visit the Perito Moreno Glacier, contingent on the proposed development. The greater proportion of income the respondent spent on the trip, the more likely they would visit the region again with the proposed development shown. If the respondent was a male or was from Argentina, he was more likely to visit the region. In addition, the older the respondent, the more likely he or she was to visit the Perito Moreno Glacier again. The level of education variable (EDUC) and level of satisfaction with their trip to El Calafate variable (SATISFEC) both had negative relationships with the likelihood of revisiting Glaciers National Park for Scenario I and Scenario III, but each had positive relationships with revisiting the region under Scenario II.

99

A single-bounded tobit model was constructed for each development scenario in order to estimate the contingent valuation model. The results of each of the tobit models can be seen in Tables 3.23, 3.24 and 3.25.

Table 3.23: Contingent Valuation Tobit Model for Development Scenario I

Variable	Coeff.	Std. Error	z-Stat.
CONSTANT	6.38	74.82	0.09
LANGUAGE	-25.34	17.54	-1.44
TOURPCKG	14.52	14.26	1.02
SATISFEC	0.55	8.77	0.06
GENDER	20.35	14.12	1.44
AGE	0.55	0.52	1.05
ARGIE	-12.37	16.64	-0.74
EDUC	-3.03	3.72	-0.82
INCPROP	1.54	107.15	0.01
SIGMA (Disturbance Std. Dev.)	91.86	6.09	15.09
Log Likelihood			-803.26
LM Test for Tobit			104.03
Degrees of Freedom			9
Number of Observations			237

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 3.24: Contingent Valuation Tobit Model for Development Scenario II

Variable	Coeff.	Std. Error	z-Stat.
CONSTANT	63.76	71.64	0.89
LANGUAGE	-18.36	16.38	-1.12
TOURPCKG	19.79	13.88	1.43
SATISFEC	-4.10	8.23	-0.50
GENDER	20.71	13.38	1.55
AGE	0.35	0.50	0.71
ARGIE	-25.17*	15.61	-1.61
EDUC	-4.65	3.56	-1.31
INCPROP	-234.93	225.61	-1.04
SIGMA (Disturbance Std. Dev.)	86.59	5.81	14.91
Log Likelihood			-783.63
LM Test for Tobit			80.76
Degrees of Freedom			9
Number of Observations			236

* p < 0.10; ** p < 0.05; *** p < 0.01

Table 3.25: Contingent Valuation Tobit Model for Development Scenario III

Variable	Coeff.	Std. Error	z-Stat.
CONSTANT	42.01	91.82	0.46
LANGUAGE	-23.13	21.11	-1.10
TOURPCKG	16.43	17.43	0.94
SATISFEC	-2.67	10.70	-0.25
GENDER	28.08*	17.30	1.62
AGE	0.32	0.64	0.50
ARGIE	-25.61	20.22	-1.27
EDUC	-4.36	4.54	-0.96
INCPROP	29.63	132.23	0.22
SIGMA (Disturbance Std. Dev.)	110.94	7.59	14.62
Log Likelihood			-790.94
LM Test for Tobit			83.17
Degrees of Freedom			9
Number of Observations			234

* p < 0.10; ** p < 0.05; *** p < 0.01

101

The proxy for culture (LANGUAGE and ARGIE) demonstrated similar effects for the maximum willingness to pay to avoid development across all scenarios. If the respondent was from Argentina and completed the survey in Spanish, they were willing to pay less than international English speaking tourists. This could be due to the fact that the "local" tourists viewed the telecommunication and construction infrastructure as providing services (and benefits) to the region, which may be of more importance to a "local" tourist versus an international tourist. If the respondent was a male or purchased a tour package, he or she was willing to pay more to avoid the development shown. Additionally, the older the tourist, the more he or she was willing to pay to avoid the higher intensity development. The level of education had a negative relationship with willingness to pay to avoid development across all three scenarios which could be attributed to the notion that higher educated individuals may have viewed the development as a relatively minor disturbance given the perceived potential commercial or infrastructural benefit to the region. The more satisfied the respondent was with their trip to El Calafate, ceteris paribus, the less they were willing to pay to avoid development as shown in Scenarios II and III. However, a positive relationship exists between satisfaction level and willingness to pay to avoid the telecommunication infrastructure as shown in Scenario I. Lastly, the greater the respondent's proportion of income was spent on their trip to El Calafate, the more he or she was willing to pay to avoid Scenarios I and III, while for Scenario II, the respondent was willing to pay less.

While the contingent behavior and contingent valuation models do not appear to produce very statistically significant results, it still reveals very important financial, economical and regional results. One reason why the models' explanatory power is so

102

poor could be due to the fact the respondents' maximum willingness to pay to avoid any

of the development scenarios is less than one percent of their trip expenditures.

Therefore, there is not enough variation in the dependent variable to explain.

3.5.1: Using Pictures of Alternative Levels of Development

Pairwise t-tests were conducted to test the significant difference between

coefficients for the three development scenarios across both valuation techniques

(contingent valuation and contingent behavior). For the contingent behavior models, no

variables were found to be statistically different. While for the contingent valuation

models there were only three variables that were statistically different, whether the

respondent was from Argentina or not (ARGIE), whether the survey was administered in

English or Spanish (LANGUAGE) and the proportion of income spent on the trip

(INCPROP). The proportion of income was statistically different across each scenario.

The nationality variable (ARGIE) and the elicitation language (LANGUAGE), which can

be interpreted as a proxy to culture was statistically different between Scenario I and

Scenario III and between Scenario II and Scenario III, but there was no difference

between Scenario I and Scenario II. Therefore, the respondent's culture influences his or

her responses to a less developed view (Scenario I or Scenario II) versus a more

developed scenario (Scenario III).

Relatively little variation in the probability for the respondent's to visit El

Calafate again contingent on the different development scenarios is observed (Table

3.16). The mean willingness to pay values to avoid development shown in Scenario I

($15), Scenario II ($15) and Scenario III ($18) are fairly low relative to their total trip

103

expenditures ($3,238) shown in Table 3.10 (Table 3.17). Actually, the respondent's willingness to pay to avoid the development scenarios is only 0.46% (for Scenarios I and II) and 0.56% (for Scenario III) of their current expenditures. Therefore, it can be concluded that the development shown in the digitally altered pictures is not drastic enough to motivate the visitors to not be willing to pay a substantial premium to avoid. It may be that Glaciers National Park is so unique and desirable as a destination that it would take a relatively large change in other aspects of the visitation experience to drive any substantial change in visitation behavior. The extensive confluence of strip malls at the southern entrance to Great Smoky Mountains National Park in Pigeon Forge comes to mind. Table 3.19 reveals that the majority of the respondents (92.6%) believe that the government should be in charge of preserving the view which could mean that the respondents do not believe that the preservation of the viewscape should come out of their pockets directly. Rather, preservation of the natural and cultural heritage of the country is the responsibility of the entire country, expressing existence and/or bequest value for the region, not merely visitors to the region, reflecting only nonconsumptive use values.

3.5.2: Intercept Surveys in Different Languages

In order to evaluate whether administering the survey in English or Spanish had a significant impact on survey responses, a dummy variable was created and incorporated into the six regressions found in Tables 3.20 through 3.25. Next the statistical significance of the survey elicitation language dummy variable was tested. In order for language to be considered statistically significant, for example, at the 90% level, the z-

104

statistic in the model needs to have a probability less than 0.10. Therefore, the survey elicitation language is considered to be a statistically significant factor for the contingent behavior models in Scenario I and Scenario II (Tables 3.20 and 3.21, respectively). The survey elicitation language is not statistically significant for any of the contingent valuation models. Hence, the survey elicitation language does have a minimal impact on determining a respondent contingent travel behavior. However, it is still important to further administer surveys in different languages so to gather a more representative sample of international tourists.

3.5.3: Tour Package Purchase Impacts

The evaluation of tour package purchase impacts is conducted similarly to the language elicitation impact analysis. A dummy variable was created and incorporated into the six regressions found in Tables 3.20 through 3.25. The same criteria for testing the language dummy variable holds for testing the significance of the tour package variable. For both contingent behavior and contingent valuation models under all scenarios, the purchase of a tour package does not have a statistically significant impact. The reasoning behind this could be due to the fact that tour package purchases have an effect on a person's expenditures and since the willingness to pay values revealed in this study are small relative to total expenditures, it makes sense why tour package purchases may not have an impact on the responses. However, due to the regional versus national spending patterns associated with tour packages, it is still important to take tour package purchases into consideration in further analysis.

105

3.6: Conclusion

Glaciers National Park in Argentine Patagonia is a globally unique natural treasure. As a tourist destination, the Park is a very important economic driver to the gateway community of El Calafate. In this study, the likely economic impact of potential infrastructure development along a scenic roadway between El Calafate and Glaciers National Park in Argentine Patagonia was estimated. Although economic valuation of scenic viewscapes has some history in the United States, this is the first study of this kind undertaken in Argentina to our knowledge. Moreover, there has been very few published works regarding economic valuation of scenic roadways.

In general, it was discovered that the natural environment was very important to all visitors' enjoyment of their visit to El Calafate. Foreign visitors to the region are wealthier; somewhat more educated, and spend more than Argentines and that people on tours spend less locally than independent travelers. In addition, people on tours spend less time in the region than independent travelers and that travelers would prefer to spend some 1-2 additional days in the El Calafate region. Further, tours often include local and non-local transportation, lodging and excursions and these expenditures do not typically find their way to the local economy.

The low willingness to pay to avoid the potential development scenarios should not be completely dismissed. While, it is a small portion of the individual's expenditure, it still proves to have a significant impact to the regional economy which is financially important for policy decisions. The total annual local economic impact of tourist visits to Glaciers National Park was approximately $85.2 million and the potential amount to be raised for the local tourism economy to leave the area undeveloped at as much as $4.5

106

million per year. Furthermore, even among those who were not willing to pay to preserve the relatively undeveloped nature of the roadway, respondents overwhelmingly indicated a preference for an unfettered view over a more developed view and they believe the government should be in charge of preserving the view.

The empirical results conclude that there is a statistical significance in the survey elicitation language which coincides with what Loomis *et al.* (2006) concluded. In addition, it was concluded that the tour package purchase decision did not have a statistical difference on whether the tourist would visit the region or their maximum willingness to pay, contingent on proposed development. The results do show that there is a difference in regional economic impacts dependent on whether or not the tourist purchased a tour package, therefore, it should still be further examined in future research. In addition, survey elicitation language should not be excluded from future data collection efforts as it would not fully capture a representative sample in an international tourist attraction destination, such as Patagonian Argentina.

REFERENCES

Beasley, Steven D., William G. Workman and Nancy A. Williams. October 1986.
"Estimating Amenity Values of Urban Fringe Farmland: A Contingent Valuation
Approach: Note." *Growth and Change,* 17(4): 70–78.

Bergstrom, John C., B. L. Dillman and John R. Stoll. July 1985. "Public Environmental
Amenity Benefits of Private Land: The Case of Prime Agricultural Land."
Southern Journal of Agricultural Economics, 17(1): 139-149.

Bhat, Mahadev G. 2003. "Application of Non-Market Valuation to the Florida Keys
Marine Reserve Management." *Journal of Environmental Management,* 67: 315-
325.

Bowker, J.M., Didychuk, D.D. 1994. "Estimation of the Non-market Benefits of
Agricultural Land Retention in Eastern Canada." *Agricultural and Resource
Economics Review* 23(2): 218–55.

Champ, Patricia A., Kevin J. Boyle and Thomas C. Brown. 2003. *A Primer on
Nonmarket Valuation.* Norwell, MA: Kluwer Academic Publishers.

Clawson, Marion and J.L. Knetsch. 1966. *Economics of Outdoor Recreation.* Baltimore,
MD: Johns Hopkins University Press.

Costa Rican Tourism Institute (ICT). 2005. *Tourism Statistical Yearly Report – 2004* (and
supporting summary data/documentation), Costa Rican Tourism Institute, San
Jose.

Eagles, Paul F.J and Stephen F. McCool (Eds.). 2002. *Tourism in National Parks and
Protected Areas: Planning and Management.* New York, NY: CABI Publishing.

Greene, William H. 2003. *Econometric Analysis.* 5th ed. Upper Saddle River, NJ: Prentice
Hall.

Gujarati, Damodar N. 2003. *Basic Econometrics.* 4th ed. New York, NY: McGraw-Hill
Company.

Halstead, John M.1984. "Measuring the Non-Market Value of Massachusetts
Agricultural Land: A Case Study." *Journal of the Northeastern Agricultural
Economics Council* 13(1):12–19.

Hanefors, Monica and Lena Larsson Mossberg. 1999. "Package Tourism and Customer Loyalties." In Abraham Pizam and Yoel Mansfeld (Eds.), *Consumer Behavior in Travel and Tourism* (pp. 185-203). New York: Haworth Hospitality Press.

Kido, Antonio and Andrew Seidl. 2007."Optimizing Protected Area Entry Fees Across Stakeholders: The Monarch Butterfly Biosphere Reserve, Michoacan, Mexico." *Environment and Development Economics,* Forthcoming.

Kido, Antonio, Andrew Seidl and John Loomis. 2005. "Panel Estimators that Combine Travel Cost and Contingent Behavior Data Sets for Evaluating Protected Areas." *Agricultura, Sociedad y* Desarrollo 2(2): 75-82.

Loomis, John, Lindsey Ellingson, Armando Gonzalez-Caban and Andy Seidl. July 2006. "The Role of Ethnicity and Language in Contingent Valuation Analysis: A Fire Prevention Policy Application." *The American Journal of Economics and Sociology,* 65(3): 559-586.

Mak, James. 2004. *Tourism and the Economy: Understanding the Economics of Tourism.* Honolulu, HI: University of Hawai'i Press.

Mathews, Leah G., Susan Kask, Laura Rotegard, Gary Johnson and Steven Stewart. 2004. "How Much Do Visitors Value Scenic Quality?: Results from the Blue Ridge Parkway Scenic Experience Project." Harmon, David, Bruce M. Kilgore, and Gay E. Vietzke, eds. Protecting Our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites. (Proceedings of the 2003 George Wright Society / National Park Service Joint Conference.) Hancock, Michigan: The George Wright Society, 2004.

McConnell, Virginia, and Margaret Walls. January 2005. "The Value of Open Space: Evidence from Studies of Non-Market Benefits." Resources for the Future. Accessed at: http://www.rff.org/rff/Documents/RFF-REPORT-Open%20Spaces.pdf. Accessed February, 2005.

McLeod Donald, Jody Woirhaye, Carol Kruse and Dale Menkhaus. 1999. "Private Open Space and Public Concerns." *Review of Agricultural Economics,* 20(2): 644-653.

Mowforth, Martin and Ian Munt. 2003. *Tourism and Sustainability: Development and New Tourism in the Third World.* 2nd ed. London, UK: Routledge.

Pizam, Abraham. 1999. "Cross-Cultural Tourist Behavior." In Abraham Pizam and Yoel Mansfeld (Eds.), *Consumer Behavior in Travel and Tourism* (pp. 393-411). New York: Haworth Hospitality Press.

Racevskis, Laila, Mary Ahearn, Anna Alberini, John Bergstrom, Kevin Boyle, Larry Libby, Robert Paterson and Michael Welsh. 2000. "Improved Information in

109

Support of a National Strategy for Open Land Policies: A Review of the Literature and Report on Research in Progress." Paper presented at the 24th International Conference of Agricultural Economics, August 13-18, 2000. Accessed at http://are.berkeley.edu/courses/ARE242/spring05/classReadings/newValuation/Racevskis_2000.pdf. Accessed on August, 2005

Ready, Richard C., Mark C. Berger and Glenn C. Bouquets. Fall 1997. "Measuring Amenity Benefits from Farmland: Hedonic Pricing vs. Contingent Valuation." *Growth and Change,* 28(4): 438–58.

Rosenberger, Randall S. and John B. Loomis. Summer 1999. "The Value of Ranch Open Space to Tourists: Combining Observed and Contingent Behavior Data." *Growth and Change.* 30: 366-383.

Rosenberger Randall S. and Richard G. Walsh. 1997. "Non-Market Value of Western Valley Ranchland Using Contingent Valuation." *Journal of Agricultural and Resource Economics,* 22(2):296-309.

Stephenson, W. Robert. Undated. "Two Independent Samples." Department of Statistics. Iowa State University.

Tyrrell, Timothy J. and Maureen F. Devitt. 1999. "Valuing Changes to Scenic Byways." In Abraham Pizam and Yoel Mansfeld (Eds.), *Consumer Behavior in Travel and Tourism* (pp. 227-244). New York: Haworth Hospitality Press.

Tyrrell, Timothy J. and Maureen F. Devitt. 1996. "An Analysis of the Economic Impact of Scenic Byway Treatments in Vermont: A Pilot Study." Impact Research Associates, Inc: Kingston, RI.

Varian, Hal R. 1984. *Microeconomic Analysis.* 3rd ed. New York, NY: W.W. Norton & Company.

Weeks, Michael F. and R. Paul Moore. Summer 1981. "Ethnicity-of-Interviewer Effects on Ethnic Respondents." *Public Opinion Quarterly.* 45(2): 245-9.

Welch, Susan, John Comer and Michael Steinman. Spring 1973. "Interviewing in a Mexican-American Community: An Investigation of Some Potential Sources of Response Bias." *Public Opinion Quarterly.* 37(1): 115-26.

Willis, Kenneth G. and Guy D. Garrod. 1993. "Valuing Landscape: A Contingent Valuation Approach." *Journal of Environmental Management,* 37:1-22.

CHAPTER 4: RANCH OPEN SPACE, ROUTT COUNTY, COLORADO

4.1: Introduction

4.1.1: Introduction

Tourists are attracted to certain travel destinations due to the natural amenities the area may offer, for example, the surrounding landscape (Cottrell *et al.*, 2005; Cohen, 1979; Lengkeek, 2001). A tourist may prefer an undeveloped landscape such as ranch open space to a more developed landscape or vice versa. Specifically, ranch open space may provide additional benefits to the tourist and his or her experience which translate into additional visitor expenditures. These additional benefits can be translated into additional income for the local economy. If ranch open space were converted into higher intensity uses, such as commercial or residential development, economic activity in the region may increase or decrease due to consumer preferences. While the influence of most urban developments on economic returns to the region is quite easily understood through market signals, the potential benefit of *not* developing the open space may be substantially less easily detected and analyzed. Since tourists may enjoy one view over another through their direct experience, but do not consume or possess the view in a way that other travelers or residents cannot also enjoy it, landscapes such as ranch open space have features of public goods. Therefore, ranch open space will be underprovided by market mechanisms due to free riding behavior. Specifically, the tourists' nonconsumptive use value needs to be estimated in order to approximate the value of the

111

ranch open space. The purpose of this study is to estimate the value of ranch open space to nonresident summer visitors to Routt County, Colorado.

4.1.2: Study Site: Routt County, Colorado

Steamboat Springs, the county seat of Routt County, Colorado is a unique community and tourist destination, possessing a distinctive Rocky Mountain landscape, plentiful outdoor recreation, culinary and cultural opportunities and a long tradition of the "Old West." Cattle ranching and its related industries has long been a central feature of Routt County's private land use and community culture. In recognition of the contribution of working landscapes to the well being of the community, Routt County implemented a voluntary purchase of development rights program in order to help to preserve this traditional lifestyle in the county's vast valleys in 1995.

Landowners and residents of Routt County certainly benefit from the local protection of ranch open space. What remains unclear is to what extent visitors to Routt County appreciate the working landscape attributes of the region. Moreover, if ranch open space contributes to the Routt County tourism experience, then ranchers and the broader community may be subsidizing the local tourism industry through their land stewardship and land conservation policy.

4.2: Economic Valuation of Ranch Open Space

The purpose of this study is to estimate the nonmarket value for open lands preservation and the contribution of Routt County's working landscapes to the regional economy. Rosenberger and Loomis (1999) conducted similar research in conjunction

112

with the Routt County Board of Commissioners during the summer of 1993 to determine if tourists supported the preservation of ranch open space. The study concluded that there was no overall effect of converting ranch open space to resort and urban uses. They found that 25% of the sample would reduce visitation and 23% of the sample would increase visitation after developing existing ranch open space. Here, we largely replicate that study a decade after the public policy to protect ranch open space in Routt County was enacted.

This study explains the type of tourist that visits the Steamboat Springs area during the summer months. Tourists' attitudes toward natural and man-made assets provided within Routt County are discussed. In addition, the characteristics of the respondents' trips to the Steamboat Springs area are examined, specifically the type of activities tourists partake in, how far they travel to Steamboat Springs and how much they spend within the Steamboat Springs local economy. Lastly, tourists' behavior contingent on potential urban development in the Steamboat Springs area is analyzed.

4.2.1: Evaluating Summer Tourists' Willingness to Pay Over Time

Tourists' motivation to travel to a particular destination varies across people (Cottrell *et al.*, 2005; Elands and Lengkeek, 2000; Lengkeek, 2001; Lengkeek, 2000). The modes of travel, length of stay and expenditure patterns also differ across tourists. It is important for a tourism community to understand what attracts tourists' to their region. Over time, as people have different life experiences, their preferences may change. This in turn may lead to different motivations behind visiting a particular region as a travel destination. In order to capture tourists' attitudes toward these amenities over time,

113

information regarding tourists' traveling behavior, expenditures and willingness to pay for these amenities need to be analyzed over multiple years. This research evaluates tourists' values of conserving ranchland open space from 1993 to 2005.

Loomis (1989) surveys the same households and visitors to Mono Lake over the span of nine months to test the reliability of the contingent valuation method. The survey was distributed as a mail survey. Loomis (1989) concludes that the contingent valuation method provides stable and reliable willingness to pay values over time. Reiling *et al.* (1990) extends this research by incorporating seasonality in order to test temporal reliability of the contingent valuation method. Specifically, Reiling *et al.* (1990) conducts a household mail survey during peak fly season and after fly season in regards to black flies along Penobscot River in Maine. Different households received the surveys in the two stages; however, the descriptive statistics between the samples were not statistically different. Reiling *et al.* (1990) finds no statistical difference among willingness to pay values and concludes that the contingent valuation results are reliable and do not vary with time. Both of these studies used mail surveys while this study uses intercept surveys. Further this research evaluates different values over a greater span of time compared to the studies carried out by Loomis (1989) and Reiling *et al.* (1990).

Magnan (2005) uses mail surveys to estimate residents' economic value of ranch open space in Routt County. In addition, Magnan (2005) uses comparative statistics to determine whether differences exist among residents' demographics, attitudes, preferences and willingness to pay values from 1994 to 2004. He concluded that Routt County residents are changing, demographically; however, their preferences remain constant in regard to ranchland open space. Further, it was established that willingness to

114

pay values increased slightly from 1994 to 2004. This research will evaluate if there is a

statistical difference among tourists' demographics, travel behavior, travel expenditure,

attitudes, preferences and willingness to pay values in regards to ranchland open space in

Routt County using an intercept survey. This research will combine the independent cross

sections from the two different years and test the panel for statistical difference among

responses.

4.2.2: Comparing Tourists' Behavior and Values Associated with Land Use Changes

In order to derive the economic value of public goods, a nonmarket valuation

method needs to be employed (Freeman III, 2003). Stated preference methods are one

form of nonmarket valuation. Stated preference methods are survey based approaches

that rely on answers to carefully worded nonmarket valuation questions (Brown, 2003;

Loomis, *et al.,* 2006). Stated preferences have been used for more than 40 years; during

this time, over 2,000 quantitative studies have been conducted in regards to real world

problems ranging from water quality, wilderness preservation, health care and food safety

(Carson, 2000; Stevens, 2005). The two types of stated preference methods used in this

study are the contingent valuation method and the contingent behavior method.

The contingent valuation method is facilitated by positing behavioral changes due

to different values contingent on the provision of a change to the good under question. It

is a direct interview (i.e. survey) approach that can be used to provide acceptable

measures of the economic value of recreation opportunities as well as the preservation of

natural resources (Lindberg, 2003; Loomis and Walsh, 1997). The objective of the

contingent valuation method is to measure consumer surplus for the environmental

115

attributes of a tourism product. The contingent valuation method is based on two assumptions. The first assumption is that the respondent has well-defined preferences for the natural resource being valued relative to other resources he or she could purchase. The second assumption is that the nonmarket value can accurately be elicited from the respondent via a survey or interview (Loomis, 2002a).

While the contingent valuation method elicits a value statement for a nonmarket good, contingent behavior is used to estimate changes in behavior for a nonmarket good. The contingent behavior method asks respondents about their intended visitation behavior given a proposed change to the good (Chase *et al.*, 1998). Specifically, the contingent behavior method is used to measure the current number of trips or days the respondent plans to spend at their desired tourist location and provides the respondents an option to change the number of trips or the number of days on a given trip with hypothetical changes to the area (Lindberg, 2003).

Stated preference methods are commonly criticized because of the hypothetical nature of the questions and the fact that actual behavior is not observed (Cummings *et al.*, 1986; Loureiro *et al.*, 2003; Mitchell and Carson, 1989). However, Manski (2000) states that in order to address the important issues surrounding stated preference controversy the stated preference methods must be refined.

Herath (2002) contends that diversity in contingent valuation applications is required to suit different circumstances, particularly in the case of valuing viewscapes. Adamowicz *et al.* (1994) argue that the strength of the contingent valuation method as a natural resource valuation tool is improved if it is implemented in combination with another nonmarket valuation technique. Here, we explore this contention by including

116

both contingent valuation and contingent behavior estimates. This research will compare the results between these two stated preference methods, since the contingent valuation results are in terms of dollars and the contingent behavior results are in terms of days. Therefore, in order to compare among the two valuation techniques, a common metric needs to be created. Specifically, this study will compare the percentage change in trip days (contingent behavior results) and the percentage change in willingness to pay values (contingent valuation results) contingent on converting ranch open space into urban uses.

4.2.3: Regional Impacts of Ranch Open Space

In order to fully realize tourists' values associated with conserving ranch open space, the impacts to the local economy need to be evaluated. Magnan and Seidl (2004) discuss in general tourism development by county throughout the state of Colorado. Specifically, they use IMPLAN to examine tourism spending, tax revenue, and employment characteristics tied to tourism in each county. Magnan and Seidl (2004) conclude that tourism plays an important role in Colorado's economic health. Kiker and Hodges (2002) estimate the economic benefits of natural land conservation within four counties in Northeastern Florida. The study uses IMPLAN to conduct export base analysis in order to calculate economic impacts related to natural land conservation. Kiker and Hodges (2002) concluded that positive willingness to pay exists for maintaining natural ecosystems and that outdoor recreation is important to Florida's economy. Further, they determine that with well planned development, economic growth can occur while conserving natural lands.

117

This research will follow Kiker and Hodges (2002) in application to Routt County's economy in Colorado. The foundation will be based on findings of Routt County calculated in the study by Magnan and Seidl (2004). An IMPLAN model will be constructed for Routt County's economy. Nonmarket values will be incorporated into the regional model to more fully capture the impact of conserving ranchland open space to Routt County's tourism economy. Specifically, two separate models will be constructed, one to illustrate rural-oriented losses and one to illustrate urban-oriented gains associated with the land use conversions.

4.3: Methodology

4.3.1: Data Collection

The intent of our sample frame is to represent summer tourists to Routt County. Summer tourists of 2005 were randomly intercepted at seven different locations throughout Routt County from early July through mid September of 2005. Surveys were randomly distributed during weekends and weekdays. Survey collection areas were equally distributed among three main locations: the airport (32.3%), the visitor center at Steamboat Lake (28.8%) and locations around the town of Steamboat Springs (38.9%) (Table 4.1). The survey crew consisted of Colorado State University graduate students, who were visibly identifiable as such.

The data for the summer tourists during 1993 was obtained through the intercept of every fifth adult entering one of several locations throughout Steamboat Springs, on stratified random days, with half on the weekend and half on weekdays, during the afternoon. The surveys were conducted as in-person, intercept interviews. The interviews

118

were conducted by a professional survey firm as part of the annual summer visitor for the

Steamboat Springs Chamber of Commerce (Rosenberger and Loomis, 1999). Potential

survey respondents for both data sets were filtered by a series of introductory questions in

order to establish that they were adults and non-residents of Routt County.

Table 4.1: Location of Survey Distribution

Location	Count	Percentage
Airport	131	32.3%
Visitor's Center	117	28.8%
Mt Werner Village	89	21.9%
Baseball Fields	52	12.8%
Rodeo Grounds	13	3.2%
Art Depot	4	1.0%
Total	406	100.0%

4.3.2: Survey Format

The surveys administered in 1993 and 2005 asked many of the same questions in

order to facilitate a comparable analysis. Respondents were asked about their trip

activities, preferences about natural and man-made assets, reasons for maintaining open

space, length of their trip and general demographic questions. In addition, contingent

valuation, contingent behavior and travel expenditure questions were included in both

surveys. Specifically, the 2005 survey was four pages in length and was completed by the

tourist in approximately 15 minutes (Appendix IV: Routt County Visitor Survey).

4.3.3: Model Specification and Hypotheses

The contingent behavior and the contingent valuation models combined with

travel expenditure data are employed in order to quantify tourists' values of ranchland

open space. The contingent valuation portion of the survey asks if existing ranchlands

had changed to urban uses, would it make the respondent's vacation experience worth fewer (or more) dollars per day. The respondent could state whether it would be worth fewer dollars per day, no effect on daily spending or worth more dollars per day. If the respondent stated it would cause their tourist experience to be worth more (or fewer) per day, they were then asked to specify how much more (or less) per day it would be worth.

The contingent behavior portion of the survey is similar to that of the contingent valuation portion as it asks a two part contingent behavior question. The difference between the contingent questions is that the contingent behavior portion of the survey inquires if the respondent would visit the Steamboat area fewer (or more) days if the existing ranch lands were converted to urban uses. Further, the respondent was asked to specify how many fewer (or more) days they would visit the region. The contingent questions allow for positive (increase in willingness to pay and more days for reduction of ranch open space) and negative (decrease in willingness to pay and fewer days for reduction in ranch open space) values, therefore the ordinary least squares regression will be used to evaluate the responses (Greene 2003; Maddala, 1996).

The travel expenditure portion of the survey asks respondents to quantify their expected expenditures on their current trip. Further, respondents were asked to determine the proportion of the expenditures spent in the Steamboat area. Next, tourists were asked if they would visit the region fewer days if the cost of travel increased by a given bid amount. The bid amount was randomly distributed among respondents and possessed the following values: $10, $25, $50, $75, $100, $200, $300, $500, $750, $1000, $1500, and $2000. If the respondent answered "yes" to this question, they were further asked how

120

many fewer days they would travel to the region. The travel expenditure data will be

incorporated into the contingent valuation and contingent behavior models.

In general, it is hypothesized that people with higher incomes, who travel greater

distances, are more educated and are older will spend more money in the local economy.

It is further hypothesized that these people will be willing to pay more to conserve

ranchland open space and that these people will be less sensitive to changes in travel

costs or travel behavior.

The first objective of this study is to test whether there is a statistical difference in

responses from 1993 to 2005. The following ordinary least squares regression was used

for these analyses:

$$\text{CV DOLLARS} = \beta_0 + \beta_1 \text{ AGE} + \beta_2 \text{ INCOME} + \beta_3 \text{ STATE} \qquad (1)$$

The variables used for the analysis were the respondents' value of their vacation

experience contingent on if the ranch lands were converted to urban uses (CV

DOLLARS), age of respondent (AGE), annual household income (INCOME) and

whether the respondent was a resident of Colorado (STATE). The respondents' value of

their vacation experience was given a positive value if the respondent stated they valued

the Steamboat area more and a negative value if the respondent stated they valued the

Steamboat area less with the conversion of ranch lands to urban uses. The age variable is

the respondents' age in years. The income variable is the respondents' gross annual

household income. Further, the 1993 data was adjusted for inflation so it is comparable

with the 2005 dollar values. The state resident variable is a dummy variable based on the

state the respondent lives and was coded as: 1=Out of state resident and 0=Colorado

resident (Table 4.2). It is important to note that the selection of independent variables for

121

this analysis is constrained due to the fact that there were only a limited number of

variables that were similar across the two data sets (1993 and 2005).

Table 4.2: Explanation of Variables for Comparison Across Time

Variable	Explanation
AGE	Age of the respondent, in years.
CV DOLLARS	Amount the respondents' vacation experience in the Steamboat area is worth, in 2005 dollars per day, if the existing ranch lands had changed to urban uses. (Positive value if it is worth more per day and negative value if it is worth less per day.)
INCOME	Gross Annual Household Income, in 2005 dollars
STATE	Dummy Variable: 0=Colorado state resident; 1=Out of state resident
YEAR	Dummy Variable: 0=1993 survey responses; 1=2005 survey responses

Since visitors' expenditures, preferences and quite likely, demographics change

over time, it is hypothesized that their travel behavior and willingness to pay for ranch

lands will also change over time. The surveys were administered during 1993 and 2005 in

order to capture tourists' behaviors, preferences and travel behavior over time. Since

people's experiences and preferences change over time, it is hypothesized that their travel

behavior and willingness to pay for ranch lands will also change over time. It is unknown

whether these changes will lead to higher or lower values. Therefore, the general null

hypothesis is that the time of survey distribution is independent of the respondent's

survey responses associated with their trip to the Steamboat region. The first null

hypothesis is that the respondents' decrease (or increase) in willingness to pay contingent

on if existing ranch lands were converted to urban uses is independent on when the data

was collected, as follows:

H_0: $\beta_{1993} = \beta_{2005}$

122

Similar to the method employed in Loomis *et al.* (2006), separate models, one for each year and a pooled model of both years will be created and the coefficient equality will be statistically tested using the Chow test. The Chow test involves calculating the F-statistic by using the following formula:

$$F = \frac{(RSS_R - RSS_{UR}) / K}{(RSS_{UR})/(n_1 + n_2 - 2K)} \qquad (2)$$

Where:

RSS$_R$: Residual Sum of Squares for the Pooled Model
RSS$_{UR}$: Sum of the Residual Sum of Squares for the separate models (1993 and 2005)
K: Number of variables
n1: Number of observations for the 1993 sample
n2: Number of observations for the 2005 sample

The calculated F-statistic is compared to the critical F-statistic, given degrees of freedom. If the calculated F-statistic is greater than the critical F-statistic, then the null hypothesis will be rejected. In addition, the data sets will be pooled together with a dummy variable representing the year the survey was administered. The statistical significance of the coefficient will be examined by its corresponding t-statistic to determine if there is a statistical difference among the years (Gujarati, 2003).

The second objective of this study is to examine the differences between the results of the two valuation techniques. Since the contingent valuation results are in terms of dollars and the contingent behavior results are measured in number of days, they need to be converted into a common measure for comparison purposes. Therefore the percentage changes in results, contingent valuation and contingent behavior, is calculated in order to properly compare the results.

123

The percentage change for the contingent valuation portion was calculated using

the following equation:

$$\% \, \Delta \, WTP = \frac{\Delta \, WTP}{([WTP_1 + WTP_0] \, / \, 2)} \tag{3}$$

Where:

WTP_0: Willingness to pay with current land use (ranch open space)
$\Delta \, WTP$: Change in willingness to pay with conversion of ranch open space
WTP_1: New willingness to pay ($WTP_0 + \Delta \, WTP$)

Willingness to pay with current land use (WTP_0) is calculated by running a logit

model from the survey question regarding whether or not the respondent would visit

Steamboat Springs fewer days if the cost of travel increased by a given bid amount. The

logit model is as follows:

$$CV \, RESPONSE = \beta_0 + \beta_1 BID \tag{4}$$

The dependent variable, CV RESPONSE, is the yes or no response given by the

respondent for a given increase I n the cost of travel which is the bid variable (BID).

Independent variables were not controlled for the calculation of the current willingness to

pay measure in order to stay consistent with the other measure for equation (3). The

coefficients from this logit regression can then be plugged in the following equation in

order to derive the willingness to pay under the current land use, ranch open space:

$$Current \, WTP \, (or \, WTP_0) = \frac{\ln(1+e^{\beta_0}) \, / \, |\beta_1|}{\Delta \, Days} \tag{5}$$

Where:

β_0: Constant term from Equation (4)
β_1: Coefficient of the bid variable from Equation (4)
$\Delta \, Days$: Mean value of the change in days if the cost of travel increased by a
         given bid amount

124

The change in willingness to pay (Δ WTP) is derived from the contingent valuation question which asks if "...*the existing ranch lands around Steamboat Springs had changed to urban uses. Would this change cause your vacation experience in the Steamboat area to be worth fewer (or more) dollars per day during the summer season?*" The respondent was then asked to choose from the following three options: fewer, no change or more. If the respondent chose fewer or more, they were asked to state by how much their value would change per day. If the respondent stated they would value their experience by fewer dollars per day, their value was given a negative value and if they stated it was worth more dollars per day, their value was assigned a positive value. From this the weighted mean value was calculated to arrive at the change in willingness to pay if existing ranch lands were converted to urban uses. The weighted mean was calculated by multiplying the percent of respondents who stated they would value their experience by fewer (or more) dollars per day by the corresponding mean values. If the respondent stated that the conversion of ranch lands would not cause a change in value, they were assigned a zero value. The weighted means were summed to get the net change in willingness to pay values.

Next, the new willingness to pay was calculated as the sum of the willingness to pay with current land use patterns and the net change in willingness to pay with the proposed conversion of land in Routt County. These values were then plugged into equation (3) to arrive at the percentage change in willingness to pay.

The percentage change for the contingent behavior portion is calculated similarly to the contingent valuation portion, using the following equation:

$$\% \Delta \text{Days} = \frac{\Delta \text{Days}}{([\text{Days}_1 + \text{Days}_0] / 2)} \tag{6}$$

Where:

Days_0: Number of days visited Steamboat Springs with current land use (ranch open space)

Δ Days: Change in number of days to visit Steamboat Springs with conversion of ranch open space

Days_1: New number of days to visit Steamboat Springs ($\text{Days}_0 + \Delta$ Days)

The number of days with current land use patterns (Days_0) is taken directly from a survey questions that was stated as follows: *"About how many total days do you expect to visit the Steamboat area during 2005?"* For this study, it is assumed that the number of trip days traveled during the winter season is not affected by the proposed Routt County land use changes since skiing and snowboarding are the main drivers for winter tourists.

The change in number of days (Δ Days) is derived from the contingent behavior question which asks if *"...the existing ranch lands around Steamboat Springs had changed to urban uses. Would this change cause you to visit the Steamboat area fewer (or more) days during the summer season?"* Similar to the contingent valuation question, the respondent was asked to choose from the following three options: fewer, no change or more. If the respondent chose fewer or more, they were asked to state by how many days or fraction of days they would change the length of their trip. If the respondent stated they would travel to the area fewer days, their number of stated days was given a negative value and if they stated they would travel more days, their number of stated days was given a positive value. From this, the weighted mean was calculated to arrive at the change in days if existing ranch lands were converted to urban uses. The weighted mean

126

was calculated by multiplying the percentage of respondents who stated fewer (or more) days by the respective mean number of days. If the respondent stated there was no change to their trip length, their number of days was assigned a zero value. The weighted means were summed to get the net change in days.

The new number of days was calculated by summing the number of trip days with current land use ($Days_0$) and the net change in trip days (Δ Days) with the proposed conversion of land in Routt County. These values were then plugged into equation (6) to calculate the percentage change of trip days. From this, the percentage change in willingness to pay values can appropriately be compared to the percentage change in trip days if ranch lands were converted into urban uses.

In order to evaluate the third objective of this study, the impact of converting ranch lands to urban uses to the local economy, regional impact analysis needs to be employed. Specifically, export base analysis will be conducted in order to determine the amount of money brought into the local economy from summer tourism. The direction or magnitude of spending throughout the economy associated with conversion of ranchlands to urban uses will be approximated. IMPLAN, an input-output analysis program, will be used to quantify the economic impacts to Routt County. Based on the responses of expenditures from the tourist survey, the appropriate sectors will be shocked within the IMPLAN model. The loss of agricultural activity due to the conversion of ranchlands to urban uses will also be incorporated into the IMPLAN model. The industry output and employment impacts will be illustrated as a result of the shocks.

127

Indirect effects multipliers and induced effects multipliers will be calculated in order to determine how a dollar of direct spending impacts indirect and induced sales (Stynes, 199b). The indirect effects multiplier is calculated using the following equation:

$$\text{Type I Sales Multiplier} = \frac{(\text{direct sales} + \text{indirect sales})}{\text{direct sales}} \qquad (7)$$

The induced effects multiplier is calculated using the following equation:

$$\text{Type II Sales Multiplier} = \frac{(\text{direct sales} + \text{indirect sales} + \text{induced sales})}{\text{direct sales}} \qquad (8)$$

Direct sales represent the initial sales in the industry in question. Indirect sales are the inter-industry transactions as supplying industries respond to sales from the directly affected industries. Induced sales are the local spending that result from income changes in the directly or indirectly affected industries (Kiker and Hodges, 2002).

4.4: Descriptive Analysis

4.4.1: Tourist Demographics

In order to determine what type of tourist visits the Steamboat Springs area, respondents were asked for socio-demographic information. In addition, they were asked where they permanently reside to get a better idea of the portion of tourists from out of state who are attracted to the Steamboat Springs area. This section explains the typical visitor to Routt County during the 1993 and 2005 summer tourist seasons.

In 2005, 53% of the respondents were male and 47% were female, while in 1993, 48% were of the respondents were male and 52% were female. The mean age of a Routt County summer tourist was approximately 45 years (mean in 1993 = 43 years) and the median age was 43 years old, indicating little skewness in the age data. The mean level of

128

educational attainment of Routt County 2005 tourists is a 4-yr college degree. Some 75% of respondents have a bachelor's degree or greater, with over half of them having received a master's or professional degree (39% of total respondents).

Respondents for the 2005 survey were asked to choose from the following employment status categories: employed, retired, unemployed or work in home. The majority of the respondents are employed outside of their homes (80.6%), while 10.8% are retired, 6.6% of the respondents work in their home and 2.1% are unemployed. The mean and median number of income earners per household during 2004 is 1.7 and 2, respectively, typical of a US household.

Respondents were asked to select their annual household income before taxes from a range of income levels. The responses from the 1993 surveys were adjusted for inflation and re-categorized to fit within the 2005 income ranges. A comparison of the income levels across the years can be viewed in Figure 4.1. The mean and median annual household income range for 2005 respondents was $100,000 to $129,999 and for 1993 respondents was $40,000 to $59,999. Approximately 60% of 2005 Routt County tourists earn at least $100,000 per year. Almost 15% of the 2005 respondents earn over $300,000 a year, while 18% earn less than $60,000 per year (Figure 4.1). Higher income levels of the respondents coincide with higher education levels. This household income levels far exceed the 2004 median income in Colorado and the United States.

129

Figure 4.1: Routt County Tourists' Annual Household Income Before Taxes (Adjusted to 2005 Dollars)
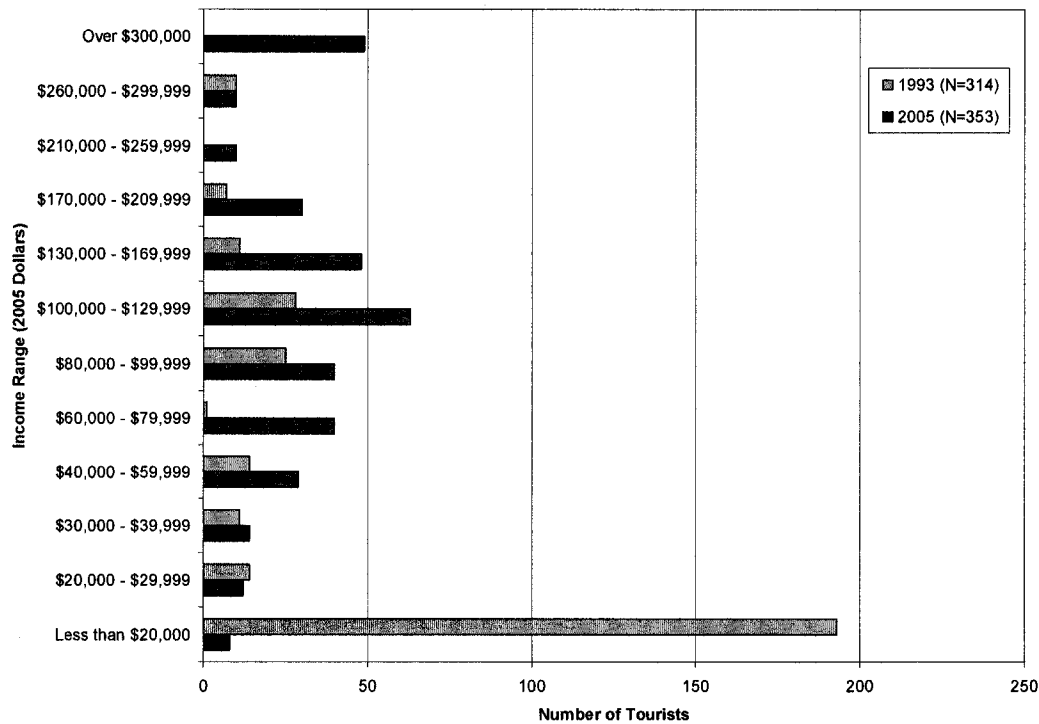
The vast majority of the Routt County summer tourists reside in the United States, while 1.2% resides in other countries. Routt County summer tourists in our sample traveled from 44 of the 50 United States. Nearly half of the respondents reside in Colorado for both the 1993 (44.5%) and 2005 (45.8%) summer seasons. Tourists from Texas and California each contribute about 7% of the 2005 summer tourist population. Florida, Pennsylvania, New York, Missouri and Minnesota residents each make up about 3% of the 2005 Routt County tourists (Table 4.3).

130

Table 4.3: State of Residence of Routt County 2005 Summer Tourists *

State	Count	Percentage	State	Count	Percentage
Colorado	185	45.80%	North Dakota	4	1.00%
Texas	29	7.20%	Virginia	4	1.00%
California	26	6.40%	Wyoming	4	1.00%
Florida	15	3.70%	Arkansas	3	0.70%
Pennsylvania	14	3.50%	Georgia	3	0.70%
New York	13	3.20%	Idaho	3	0.70%
Missouri	12	3.00%	Massachusetts	3	0.70%
Minnesota	11	2.70%	Nebraska	3	0.70%
Utah	9	2.20%	Wisconsin	3	0.70%
Illinois	8	2.00%	Kansas	2	0.50%
Arizona	6	1.50%	Montana	2	0.50%
Connecticut	6	1.50%	North Carolina	2	0.50%
Ohio	5	1.20%	New Hampshire	2	0.50%
Washington	5	1.20%	Oregon	2	0.50%
Michigan	4	1.00%	Tennessee	2	0.50%
N=404					

*NOTE: Alabama, Delaware, Indiana, Kentucky, Louisiana, Maryland, New Jersey, New Mexico, Nevada, Oklahoma, Rhode Island, South Carolina, Vermont and Washington, D.C. have one observation each.

Of the 2005 respondents from Colorado, 54.1% reside in the Denver metropolitan area. Larimer County (includes the cities of Fort Collins and Loveland) the nearest large population center to Routt County, residents account for approximately 14% of the Colorado residents. Boulder County (includes the cities of Boulder and Longmont) and Weld County (includes the city of Greeley) residents comprise 9.7% and 5.9% of Colorado residents, respectively (Table 4.4).

131

Table 4.4: County of Residence for In-State Routt County 2005 Summer Tourists

County	Count	Percentage
Denver Metro Area	101	54.6%
Larimer County	26	14.1%
Boulder County	18	9.7%
Weld County	12	6.5%
El Paso County	9	4.9%
Summit County	6	3.2%
Moffat County	4	2.2%
Eagle County	2	1.1%
Grand County	2	1.1%
Douglas County	1	0.5%
Gunnison County	1	0.5%
Lake County	1	0.5%
Logan County	1	0.5%
Mesa County	1	0.5%
Total	185	100.0%

The Steamboat Springs area has been attracting summer visitors with significantly larger household income levels compared to the visitors from a little over a decade ago. In summary, the typical 2005 summer tourist to Steamboat Springs is a Colorado resident male in his mid-40s with an annual household income of at least $100,000, while the typical 1993 summer tourist is a Colorado resident male in his early-40s with an annual household income of about $50,000 in 2005 dollars. The distribution in 1993 was strongly skewed toward individuals earning very little. No information exists to confirm or refute the representativeness of the 1993 sample. The 2005 sample confirms our pre-study observations and expectations.

132

4.4.2: Tourists' Trip Length, Activities and Expenditures

In order to further understand the typical Steamboat Springs summer tourist, their trip characteristics need to be analyzed. Specifically, the length of their stay in Routt County, the activities they participate in while in the area and where they spend their money. This section explains the characteristics of a summer trip to Steamboat Springs.

Visitors to the Steamboat Springs area expected to stay an average of approximately eleven days during 2005, with a median of six days. In addition, they plan on spreading those days over a mean of 2.7 trips with a median of one trip to the Steamboat Springs area. Therefore, the average summer tourist trip to Routt County is about 4 days. On average, a 2005 Routt County tourist traveled approximate 857 miles (812 miles in 1993) and about 6.5 hrs travel time one way for their current trip to the Steamboat Springs area. Survey respondents were asked how many miles (one-way) from their home they would travel to visit a substitute site with comparable ranch open space as Routt County. In 1993, tourists stated they would travel 563 miles (one-way) while 2005 tourists stated they would travel 996 miles (one-way) to another resort area with scenery comparable to the existing ranch lands around Steamboat Springs. In addition, 90% of the 2005 respondents stated that their current trip to the Steamboat Springs area was the sole purpose of their travel.

To determine what 2005 summer tourists do while on their trip to Routt County, survey respondents were asked to select from a list of primary activities he or she participated in during their most recent trip to the Steamboat Springs area. Respondents were allowed to select as many activities as pertained to their current trip (Table 4.5). The

133

most frequent activity participated in during the summer by tourists is hiking and walking. Approximately half of the respondents partake in shopping, sightseeing/photography or driving for pleasure. Between 20% and 40% of respondents state that wildlife viewing, fishing, bicycling or picnicking is among their primary activities. While only 9.8% of the 2005 respondents stated that a ranch visit was a primary activity during their most recent trip to the Steamboat Springs area, 43.9% (30.7% in 1993) stated that they had visited a western ranch at some time. Fewer than 7% of the respondents stated that there were other activities that they would have liked to enjoy in the Steamboat Springs area that were not available to them.

Table 4.5: Primary Activities 2005 Tourists Participated in During Their Most Recent Trip to the Steamboat Springs Area

Primary Activities	Percentage	Primary Activities	Percentage
Hike/ Walk	62.7%	Alpine tundra/ Flower viewing	15.0%
Shop	49.3%	Camp	14.5%
Sightsee/ Photography	46.6%	Attend a Music Concert	13.0%
Drive for pleasure	41.4%	Horseback Ride	11.0%
Wildlife Viewing	37.0%	Backpack	11.0%
Fish	29.7%	Mountain/ Rock Climbing	10.0%
Bicycle/ Mt. Bike	25.0%	Ranch Visit	9.8%
Picnic	24.3%	Bird Watch	8.3%
River Raft	17.4%	Hunt	6.1%
Attend a Rodeo	16.9%	Swim/ Hot Springs	4.7%
Golf	16.7%	Wedding	3.7%
Attend Other Sporting Event	16.4%	Business/ Conference	2.9%
Visit historic sites	15.7%	Visit Family/ Friends	1.2%

N=408

In order to derive tourists' trip expenditures, respondents were asked to approximate how much they expect to spend on their current trip and what proportion of their spending they expect will be spent within Routt County by specified expenditure

134

categories. Table 4.6 displays mean and median trip expenditures by expenditure categories. In general, the expenditures were in the following categories, in descending order: lodging, food and drink, transportation, entertainment and other expenditures. Of the total trip expenditure, the mean percent and the median percent of expenditures spent within Routt County is 83.3% and 92.7%, respectively. Further, transportation expenditures have the largest deviation between total and local trip expenditures due to the fact that tourists either buy plane tickets or gasoline for their automobiles prior to arriving in the Steamboat Springs area.

Per group per trip expenditures are calculated based on the values provided by the respondents. Respondents were asked how many people were represented by the trip expenditure information they provided. The average reported group size was 4.4 people in 2005 and 3.2 people in 1993. The 2005 per person per trip expenditure values were calculated by dividing per group expenditures by the average group size. Per person per trip day expenditures were calculated by dividing the per person per trip expenditures by the average days per trip (5.4 days) to Steamboat Springs in 2005. These calculations represent the mean number of days per trip for the respondents who reported their expenditures and not the mean number of days per trip for the entire sample.

On average, a group of tourists spent $1,466 for their current trip to the Steamboat Springs area, while they spent $1,225 of that total within Routt County. On average, each tourist spent $643 for their current trip, $539 locally. A tourist spends an average of $177 per day to vacation in Routt County, with approximately $153 spent per day in Steamboat Springs' local economy. In 1993, a tourist spent an average of $88 per day, adjusted to 2005 dollars. The summer tourist today visiting Steamboat Springs is traveling in larger

135

groups from greater distances and spending about twice the amount in daily expenditures than that of a tourist twelve years ago.

Table 4.6: Routt County Tourists' Trip Expenditures

Expenditure Category	Per Group Per Trip (N=187)		Per Person Per Trip (N=187)		Per Person Per Trip Day (N=179)	
	Total	Local	Total	Local	Total	Local
Transportation						
Mean	$295.78	$129.76	$134.86	$59.43	$36.66	$18.74
Median	$100.00	$50.00	$37.50	$15.00	$9.52	$4.17
Lodging						
Mean	$520.64	$503.38	$219.67	$212.43	$79.30	$78.11
Median	$206.00	$200.00	$75.00	$75.00	$20.00	$20.00
Food and Drink						
Mean	$298.10	$268.58	$124.07	$112.25	$29.38	$27.00
Median	$200.00	$180.00	$75.00	$60.00	$16.67	$15.00
Entertainment						
Mean	$196.93	$184.89	$68.42	$63.05	$12.64	$11.93
Median	$60.00	$50.00	$20.00	$15.00	$5.00	$3.75
Other						
Mean	$156.76	$138.50	$97.28	$92.16	$18.56	$16.98
Median	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Total						
Mean	**$1,465.86**	**$1,225.12**	**$642.61**	**$539.33**	**$176.78**	**$152.76**
Median	**$800.00**	**$600.00**	**$300.00**	**$251.50**	**$75.00**	**$59.58**

4.4.3: Tourists' Contingent Trip Behavior

Although we now know what tourists spent in Routt County, we don't know what they might have spent given the opportunity to increase their local expenditures. That is, we know the minimum value tourists place on a Routt County vacation based on what they did actually spend, but not the maximum they might have spent had there been a

136

need or the sensitivity of tourist expenditures to changes in conditions in the local tourism experience. This section addresses these issues.

Respondents were asked how they would change the length of their trip to the Steamboat Springs area if the cost of traveling increased, for example, due to an increase in gasoline prices or hotel rates by a given bid amount. Respondents were faced with a dichotomous choice question as to whether they would reduce the number of days they would choose to visit Routt County under the new cost structure or not. Contingent upon a 'yes' choice to a reduction in visitation due to higher costs, respondents were asked by how many days or fraction of days they would reduce the length of their visit in order to gain an improved measure of the sensitivity of tourists to trip costs.

Each survey was assigned one randomly selected bid amount from among 12 alternatives. The bid amounts had the following values: $10, $25, $50, $75, $100, $200, $300, $500, $750, $1,000, $1,500 or $2,000. An equal number of surveys (approximately 35) were completed for each given bid amount. The percentage of respondents who stated that they would reduce the length of the trip due to an increase in trip expenditures is shown in Figure 4.2 by bid amount. As the bid amount increases, the percent of respondents who would reduce the length of their trip also increases. The mean willingness to absorb additional costs under current conditions is $122.57 per visitor, which represents $17,936,337 of additional value in a Routt County vacation and potential revenue not currently finding its way into local hands.

137

Figure 4.2: Percentage of Respondents Who Would Visit the Steamboat Springs area for Fewer Days During the Summer Season if the Cost of Travel Increased by $X
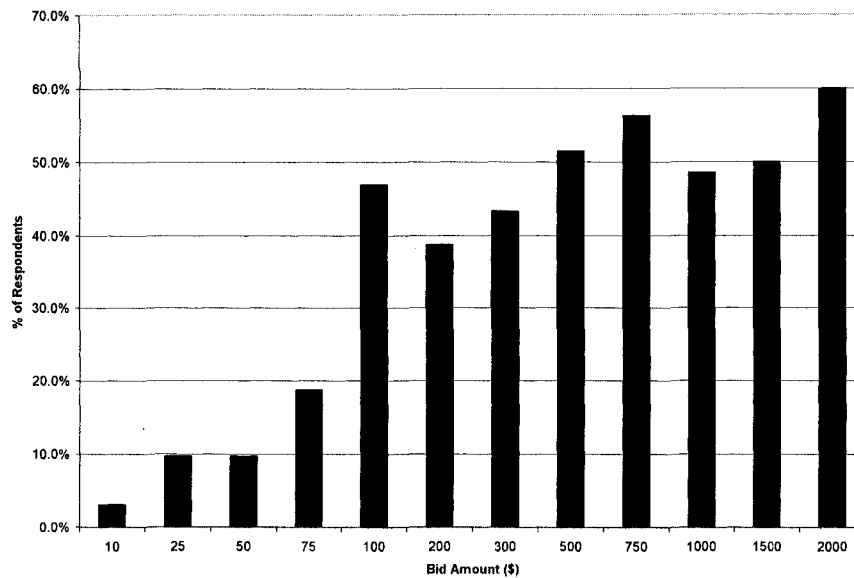
What if valuable features of the Routt County tourism experience change? Will tourists stay more or less time, spend more or less money locally? Respondents were asked how their trip length and trip expenditures might change contingent on if existing ranch lands around Steamboat Springs had changed to urban uses. Table 4.7 illustrates the percentage of respondents who would change their expenditures and trip length due to a reduction of ranch open space in Routt County. In the 1993 survey of Routt County visitors, Rosenberger and Loomis (1999) found that 25% of the sample would reduce visitation while 23% of the sample would increase visitation if ranch open space in the Steamboat Springs area were converted to urban and resort uses. The 2005 results show that approximately 50% of the respondents would reduce both their expenditures and number of days spent in the Steamboat Springs area if existing ranch lands were converted to urban uses. The average trip would be reduced by approximately three days

138

with a median value of two and half days and the average reduction in expenditures

would be approximately $70 per person per day, having a median value of $25 per person

per day. Therefore, on average, about $210 per person per trip (median value of $69.56

per person per trip) would not be spent in the Steamboat Springs area due to existing

ranch lands converting to urban uses (Table 4.7). In order to test the significance between

the fewer and no change responses among the contingent behavior and contingent

valuation responses, Pearson's chi-square test was conducted (Greene, 2003). For one

degree of freedom, Pearson's calculated chi-square is 1.294 (p-value = 0.2553).

Therefore, the significance of responses among nonmarket valuation methods is not

statistically different.

Table 4.7: Tourists' Responses If Ranch Lands Around Steamboat Springs were Changed to Urban Uses (i.e. housing and other resort development)

Would this change your vacation experience in the Steamboat Springs area to be worth fewer (or more) dollars per day during the summer season?			Would this change cause you to visit the Steamboat Springs area fewer (or more) days during the summer season?		
	N	Percent		N	Percent
Fewer	192	54.7%	Fewer	177	50.6%
No Change	157	44.7%	No Change	172	49.1%
More	2	0.6%	More	1	0.3%
Total	351	100.0%	Total	350	100.0%
Per Person Per Day Values			Days Per Trip Values		
Mean Reduction		$99.05	Mean Reduction		2.3

In order to extrapolate the per person per trip values to an annual impact value,

the total number of summer tourists needs to be estimated. The extrapolation can only be

conducted for the 2005 values due to the structural changes in the 1993 tourist season.

Based on Steamboat Springs Chamber of Commerce estimates, there are approximately

224,770 tourists who stay in hotels during a summer tourist season (Evans Hall, 2006).

To arrive at the number of tourists who camp, we divided the total visitor days at Routt

County State Parks (535,968) by the average length of a trip derived from our sample and

found that there are 134,242 total camp visitors to the Steamboat Lake and Stagecoach

State Parks located within Routt County (Colorado State Parks, 2005). It is uncertain to

the percentage of actual tourists who camp versus residents who camp at these state

parks. If we assume they are all tourists, and then there are 134,342 tourists that stay at

campsites and 224,770 that stay in hotels, then there are 359,012 tourists who visit Routt

County during a summer season. Table 4.8 displays the sensitivity analysis of total

summer tourists to Routt County based on the percentage of tourists who stay at the State

Parks.

Table 4.8: Sensitivity Analysis of Total Summer Tourists to Routt County

Hotel Tourists	Total Campers	% of Tourist Campers	Tourist Campers	Total Summer Tourists
224,770	134,242	0%	0	224,770
224,770	134,242	25%	33,561	258,331
224,770	134,242	50%	67,121	291,891
224,770	134,242	75%	100,682	325,452
224,770	134,242	100%	134,242	359,012

This sensitivity analysis can be taken a step further to show the average loss in summer

tourist revenue, based on the different percent levels of tourist who stay at state parks.

The average loss in summer tourist revenue by percent of camping tourists can be seen in

Table 4.9.

140

Table 4.9: Sensitivity Analysis of Loss in Summer Tourist Revenue to Routt County

Percent of Camping Tourists	0%	25%	50%	75%	100%
Reduction in Days per Trip	2.3	2.3	2.3	2.3	2.3
Reduction in $/day per Person	$ 99.05	$ 99.05	$ 99.05	$ 99.05	$ 99.05
Total Reduction per Person per Trip	$ 227.82	$ 227.82	$ 227.82	$ 227.82	$ 227.82
% Who Reduce Spending	54.7%	54.7%	54.7%	54.7%	54.7%
Total Visitors Who Reduce Trip	122,949	141,307	159,664	178,022	196,380
Total Amount Reduced	$28,009,670	$32,191,805	$36,373,940	$40,556,075	$44,738,210

The total loss in summer tourist revenue is incorporated into the IMPLAN model to get the whole picture of the regional impact analysis of Routt County. Therefore, for simplicity, it is assumed that half of the visitors were Routt County residents, so only 67,121 of the total camp visitors are considered non-resident tourists to Routt County to obtain a mean estimate of total impacts to the region (Table 4.8). Therefore, approximately 291,891 tourists visit Routt County during the summer months (Table 4.8). Since 54.7% of the survey respondents stated they would reduce their trip to Steamboat if existing ranch lands were converted to urban uses, approximately 159,664 tourists per year can be expected to change their trip behavior based on this land conversion (Tables 4.7 and 4.9).

To obtain the mean estimated loss of summer tourist revenue, we multiply the mean value of reduction in spending by the total number of tourists changing their trip behavior (Kiker and Hodges, 2002). Therefore, the estimated loss of summer tourist revenue due to the development of ranch open space is $36,373,940 per year (Table 4.9). The total estimated loss of summer tourist revenue will be broken down into industries

141

based on respondents' expenditure patterns to arrive at the total regional impact to Routt County with the conversion of ranchlands to urban uses.

4.4.4: Tourists' Attitudes Toward Routt County's Natural and Man-Made Assets

Understanding tourists' motivations for visiting Routt County can shed some light on these responses to potential land use change. Respondents were asked to rate how natural and man-made assets contributed to their enjoyment of a Steamboat Springs vacation. The rating was based on a nine point Likert scale where nine represented the asset strongly contributing to their enjoyment and one represented the asset strongly detracting to their enjoyment of a Steamboat Springs vacation (Table 4.10). In addition, Table 4.10 shows the percentage of respondents who rated each amenity as either adding to (a rating between 6 and 9), detracting from (a rating between 1 and 4), or having a neutral (no) effect (a rating equal to 5) on their enjoyment of their Steamboat Springs vacation.

Table 4.10: Contribution of Natural and Man-Made Assets to Tourists' Enjoyment of a Steamboat Springs Vacation

Natural and Man-Made Assets 9 point scale: 1=strongly detracts, 5=neutral, and 9=strongly adds	Mean Score	Percent of Respondents Reporting (%)		
		Adds	Neutral	Detracts
Recreation Amenities	**7.00**	**64.49**	**28.05**	**7.46**
Trails to walk, bike, ride horseback	7.91	88.86	7.88	3.26
Campgrounds, picnic sites, playgrounds	7.14	73.18	23.62	3.21
Golf courses, tennis courts	6.06	49.12	37.35	13.53
Hot springs, swimming pools	7.19	80.80	15.19	4.01
Water recreation sports	6.83	69.23	26.04	4.73
Access roads, parking	6.93	72.33	22.48	5.19
Equipment rental, guide services	6.54	63.64	30.61	5.76
Ball diamonds, ice rinks, rodeo arenas	5.98	45.76	41.82	12.42
Ski lifts, slopes	7.25	72.49	22.19	5.33
Other snow sports	6.79	63.72	30.91	5.36

142

Fishing opportunities	6.75	61.88	32.26	5.87
Hunting opportunities	5.44	32.92	46.27	20.81
Western Historical Preservation	**7.00**	**70.78**	**26.42**	**2.80**
Historical barns, buildings, structures	6.90	71.60	25.44	2.96
Protection of historical working ranches	6.99	73.78	23.17	3.05
Protection of traditional ranch family ownership	6.97	68.92	28.62	2.46
Local museums	6.67	68.21	29.01	2.78
Local western, landmarks, statues, art	6.76	71.38	25.85	2.77
Urban Development	**6.00**	**58.65**	**29.19**	**12.16**
Restaurants, Bars, Motels, Hotels	6.98	80.56	12.96	6.48
Other retail businesses	6.52	70.88	21.76	7.35
Theater, Concert Hall, Dance Studio, Other Cultural Amenities	6.27	62.58	29.56	7.86
Old Historic Buildings	6.83	75.08	20.12	4.80
Condos, Apartment Buildings	5.57	47.58	29.09	23.33
Houses on Small and Medium-sized Lots	5.23	31.97	47.65	20.38
Houses on Large Lots, 15 Acres or More	5.57	41.93	43.17	14.91
Community Services	**6.00**	**42.90**	**51.53**	**5.56**
Medical and Dental Services	6.23	52.81	43.13	4.06
Schools, Educational Services, Library	5.76	35.05	60.77	4.18
Religious Organizations	5.31	24.60	66.02	9.39
Youth Programs	5.56	31.17	62.66	6.17
Government (Law Enforcement, Road Maintenance)	6.05	47.60	47.60	4.79
Jobs (Working Conditions, Pay, Benefits)	5.81	39.23	55.31	5.47
Housing (Availability, Price, Rent, Quality)	6.05	48.89	44.13	6.98
Repair Services (Auto, House, Appliance)	5.83	40.71	55.45	3.85
Shopping (Price, Quality, Availability)	6.54	66.06	28.75	5.20
Natural Environment	**8.00**	**96.15**	**3.23**	**0.62**
Climate	8.26	94.81	4.10	1.09
Air and water quality	8.35	96.13	3.31	0.55
Rivers, Lakes, Streams, Waterfalls	8.48	96.15	3.30	0.55
Mountains, Forests, Wildlife	8.57	97.51	2.21	0.28
Ranch Open Space	**7.00**	**80.10**	**17.57**	**2.33**
Meadows	7.87	90.08	8.22	1.70
Birds, Wildlife	7.87	90.60	7.98	1.42
Viewing Cattle, Horses, Sheep	7.22	77.33	20.06	2.62
Hayland, Hay Stacks, Corrals, Ranch Buildings	6.99	71.72	24.78	3.50
Working Ranch Hands, Cowboys	6.91	70.78	26.81	2.41

The natural environment is rated as the asset that most strongly adds (average rating of 8) to the tourists' experience in the Steamboat Springs area. Specifically, at least 95% of the respondents stated that the climate, air and water quality, water and natural features add to the enjoyment of their trip. Ranch open space, western historical preservation and recreation amenities, in rank order, are local assets that strongly add (average rating of 7) to the tourists' experience. Approximately 90% of respondents claim that meadows, birds and wildlife add to their experience. From the recreational opportunities in the area, 89% stated that the trails add to their enjoyment and 81% say that the hot springs and pools add to their experience as well; while 21% claim that the hunting opportunities detract from their trip to Routt County. Community services followed by urban development also contribute (average rating of 6) to the tourists' enjoyment of their trip to the Steamboat Springs area. As far as urban development in the region, 81% state that the eating and lodging establishments add to their trip and 23% and 21% state that condos/apartments and houses on small- or medium-sized lots detract from their enjoyment of a Steamboat Springs vacation (Table 4.10).

Respondents were asked to weigh seven reasons for preserving ranch open space within Routt County (Table 4.11). Although there was equal weighting (i.e. between 14% and 15%) across categories, the highest value was placed on the protection of working ranches for conserving soil, water, wildlife, and western cultural heritage , referred to as a direct or consumptive use value (15.8%). Next, protecting ranches for potential viewing by future generations, known as the bequest value, and for private enterprise, also a direct or consumptive use value, received equal annual value weights (15.1%). The value of personally viewing (as opposed to passing along the opportunity to future generations)

144

ranch open space and managing rural development growth held values, also known as

nonconsumptive use values of approximately 14% each. Lastly, the value of knowing the

ranch open space exists without having to experience it personally, referred to as the

existence value of ranch open space, and the value for the personal opportunity to view

open space in the future, categorized as the option value, were each given between 12%

and 13% of the total annual value (Table 4.11).

Table 4.11: Reasons for Protecting Ranch Open Space in Routt County, Colorado

Reasons for Protecting Ranch Open Space	Avg. Percentage
The value of your experience *actually viewing* ranch open space (hay meadows, pastures, cattle, horses, wildlife, etc.)	14.5%
The value to retain *your opportunity* to view ranch open space in the *future*.	12.2%
The future potential for *upcoming generations* to enjoy viewing ranch open space.	15.1%
The value to you from knowing that ranch open space *exists for its own sake*, whether or not you, visitors, or future visitors actually see it.	12.9%
The value to you of conserving soil, water, wildlife, and the basis for our western cultural heritage due to *the protection of working ranches* on private lands.	15.8%
The value to you of *managing growth* to reduce dispersed rural residential development due to the continued presence of large acreage working ranches on private lands.	14.4%
The value to you from knowing that ranch land is protected as a source of *private enterprise* for ranchers and to *maintain agriculture* as part of the *local economy*.	15.1%
Total	**100.0%**

4.5 Empirical Results

4.5.1: Summer Tourists' Willingness to Pay Over Time

In order to test the hypothesis on whether there is a statistical difference among responses

given in 1993 and 2005, a Chow test of the 1993, 2005 and pooled models is used (Table

4.12). It is important to note that due to the lack of similar variables between the 1993

145

and 2005 data sets, the options for independent variables for modeling are limited. The dependent variable is how much fewer (assigned a negative value) or more (assigned a positive value) dollars per day the respondent would spend if the existing ranchlands were converted to urban uses (i.e. housing and other urban development).

Table 4.12: 1993, 2005 and Pooled Contingent Valuation OLS Models Used for Chow Test

	CV 1993 Model			CV 2005 Model			Pooled Model		
Variable	Coeff.	Std. Error	t-Stat	Coeff.	Std. Error	t-Stat	Coeff.	Std. Error	t-Stat
Constant	159.33	151.97	1.05	49.21	210.78	0.23	116.92	134.04	0.87
Age	-2.50	3.70	-0.68	-4.16	5.18	-0.80	-0.69	3.24	-0.21
Income	0.00	0.00	0.87	0.86	0.00	0.11	-1E-03**	0.00	-2.14
State	117.93	92.89	1.27	-260.33**	118.75	-2.19	-48.60	78.93	-0.62
Mean dep. Var.		153.4			-237.74			-31.16	
S.D. of regression		496.96			618.14			589.61	
Residual Sum of Squares		29,268,904			38,926,038			77,961,582	
Residual Std. Dev.		498.04			608.87			586.04	
R-squared		0.02			0.06			0.02	
Adjusted R-squared		0			0.03			0.01	
Number of Observations		122			109			231	

*p < 0.10; **p < 0.05; ***p < 0.01

Using the calculated F-statistic equation and the model results, the calculated F-statistic is 104.52. With 223 degrees of freedom, the critical F-statistic at the 95% critical level is 3.32. Therefore, the calculated F-statistic (104.52) is greater than the critical F-statistic (3.32) so the null hypothesis is rejected and it is concluded that there is a significant difference in responses between the 1993 and 2005 survey.

146

To ensure that the difference is significant, an additional testing is conducted by pooling the data and testing the significance of the dummy variable representing the year the survey was conducted (Table 4.13).

Table 4.13: Pooled Ordinary Least Squares Regression with Year Dummy Variable

Variable	Coeff.	Std. Error	t-Stat
Constant	-548.33***	31.851	-17.216
Age	0.11**	0.057	1.929
Income	-0.575	0	-0.22
State	-0.224	0.272	-0.822
Year	**-229.86***	**43.027**	**-5.342**
Mean dep. Var.			-679.33
S.D. of regression			552.45
Residual Sum of Squares			234,992,556
Residual Std. Dev.			541.6
R-squared			0.04
Adjusted R-squared			0.04
Number of Observations			806

*p < 0.10; **p < 0.05; ***p < 0.01.

The coefficient of the year variable has a probability value less than 0.01; therefore it is further shown that there is a statistical difference among responses in 1993 and 2005. Further, the coefficient states that respondents in 2005 are willing to spend approximately $230 less than the 1993 respondents with the conversion of ranch lands to urban uses, controlling for the respondents age, income level and state of residence.

Over the past twelve years, the Steamboat Springs tourist is a wealthier individual traveling in larger groups, traveling from further distances and spending significantly more in the region. If ranch lands were to be converted to urban uses, half of the respondents stated they would reduce their expenditure level by $235 per person per trip and reduce their trip length by approximately six days in 2005. Compared to the 1993 summer survey results, support for preserving ranch open space in Routt County has

147

increased from 25% to 50% of tourists stating they would reduce their travel to the Steamboat area if ranch open space were converted to urban uses. The statistical tests demonstrate that there is a statistical difference between 1993 and 2005 tourists' travel behavior, attitudes and values associated with converting ranch land to urban uses.

4.5.2: Comparison of Tourists' Behavior and Values Associated with Land Use Changes

In order to compare the results between the contingent valuation method and the contingent behavior method, the results need to be converted into comparable measures because the contingent valuation results are in terms of dollars per day while the contingent behavior results are in terms of trip days. For this study, the comparison occurs between the percentage change in willingness to pay values and the percentage change in trip days contingent on if ranch lands were converted to urban uses. To calculate the percentage change in either willingness to pay values or trip days, three measurements need to be calculated: the willingness to pay (and number of trip days) with current land use patterns, the change in willingness to pay (and change in number of trip days) with proposed land use changes and the new willingness to pay values (and new number of trip days) with the proposed land use changes. First, the percentage change in willingness to pay values will be calculated and then the percentage change in number of trip days. Lastly, the contingent valuation results (percentage change in willingness to pay) and the contingent behavior results (percentage change in trip days) will be compared.

In order to capture the willingness to pay under current land use patterns, a logit model was estimated, which and be seen in Table 4.14. Using the coefficients from the

148

Table 4.14: Logit Regression for Willingness to Pay Values Under Current Land Uses

| Variable	Coeff.	Std. Error	z-Stat.
Constant	-1.097***	0.153	-7.188
Bid Amount	0.001***	0	5.273
Mean dep. Var.			0.364
S.E. of regression			0.464
Log Likelihood			-233.68
Restricted Log Likelihood			-248.53
LR Statistic (1df)			29.71
Probability (LR Stat.)			0
McFadden R^2			0.06
Number of Observations			379

*p < 0.10; **p < 0.05; ***p < 0.01

Logit regression and equation (5), the willingness to pay value with the current level of ranch open space is calculated to be $236.57 per trip day. The change in willingness to pay values is calculated by taking the weighted mean from the contingent valuation question regarding conversion of current ranch lands into urban uses and that mean is equal to $128.80 reduction in value per trip day. By summing these two values, the willingness to pay with a proposed change in land use is calculated to be $107.77. By plugging these three values into equation (3), the percentage change in willingness to pay is calculated to be a 74.8% decrease with a proposed change of converting ranch lands into urban uses.

The percentage change in number of days requires the similar three measures. The number of trip days with current land use patterns is derived by calculating the mean number of days the respondents stated in response to a survey question asking how many days they had visited Steamboat Springs in 2005. The mean number of days a tourist visits the Steamboat area is 10.8 trip days. The change in days is calculated by taking the weighted mean from the contingent behavior question regarding converting current ranch

149

lands into urban uses and that mean value is a reduction of three days. By summing these two values, the new number of trip days with a proposed change in land use is calculated to be 7.8 days. By plugging these three values into equation (6), the percentage change in trip days is calculated to be a 32.2% decrease with the proposed change of converting ranch lands into urban uses.

In relation to a demand curve, the percentage change in willingness to pay can be viewed as the change in the price variable while the percentage change in days can be viewed as the change in the quantity variable. This interpretation can be viewed graphically in Figure 4.3. The demand for visiting Steamboat Springs under the current land use patterns is portrayed as the demand curve, $Demand_0$. With a hypothetical conversion of ranch open space into urban uses, the demand curve for visiting Steamboat

Figure 4.3: Comparison of Contingent Valuation and Contingent Behavior Results
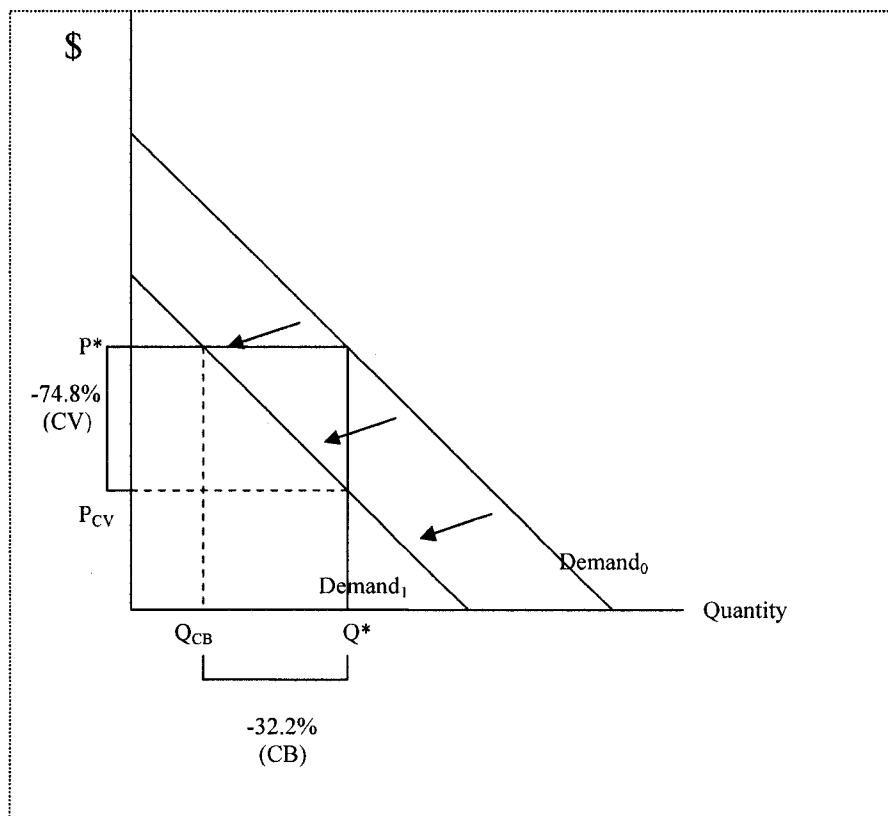
shifts back to demand curve, Demand$_1$. Therefore, for a given willingness to pay value, P*, there is a 32% decrease in the number of trip days (from Q$_0$ to Q$_1$). For a given number of trip days, there is a 75% decrease in willingness to pay values (from P$_0$ to P$_1$) with the conversion of existing ranchlands to urban uses. Since the conversion of ranch open space leads to a reduction in demand, it can be inferred that the respondent does not face a time or a budget constraint because they are either reducing their number of trip days or the amount of money they spend per day. The smaller percentage decrease in visitor days versus expenditures can be attributed to the fact that the tourists hold a high value of their surroundings while in Routt County. Changing the number of trip days may be too drastic because it's a non-marginal change, compared to changing the number of dollars spent per day which is a marginal change. Hence, the higher sensitivity in the percentage changes of willingness to pay values versus the change of trip days.

4.5.3: Regional Impact Analysis of Ranch Open Space

In order to evaluate the economic impacts to the region, two input-output models were created in IMPLAN, one to illustrate rural loss and one to illustrate urban gains. The industry sectors are un-aggregated by NAICS code and are reported in year 2000 dollars. Table 4.15 displays the industry output and employment levels for the top 25

151

Table 4.15: Routt County Industry Output and Employment Levels Under Current Land Use Patterns (*Industry Output in Millions of Dollars and Employment in Number of Jobs)

Industry		Industry Output*	Employment
462	Real Estate	320.58	1,559
48	New Residential Structures	161.40	1,013
37	Coal Mining	123.66	413
49	New Industrial and Commercial Buildings	80.78	660
463	Hotels and Lodging Places	61.63	959
56	Maintenance and Repair Other Facilities	58.21	886
454	Eating & Drinking	56.10	1,492
488	Amusement and Recreation Services	55.73	1,450
461	Owner-occupied Dwellings	51.51	0
54	New Government Facilities	49.72	311
456	Banking	38.64	173
447	Wholesale Trade	36.14	298
55	Maintenance and Repair, Residential	35.90	259
492	Hospitals	31.78	486
490	Doctors and Dentists	29.76	293
523	State & Local Government - Non-Education	28.52	717
443	Electric Services	24.75	62
455	Miscellaneous Retail	24.67	852
522	State & Local Government - Education	23.17	664
50	New Utility Structures	22.19	202
435	Motor Freight Transport and Warehousing	21.10	172
51	New Highways and Streets	20.32	177
446	Sanitary Services and Steam Supply	19.54	59
470	Other Business Services	17.85	166
506	Engineering, Architectural Services	16.88	184
ROUTT COUNTY TOTAL		1,749.66	18,921

industries in Routt County under current land use patterns, in descending order. The top five industries for Routt County are real estate, new residential structures, coal mining, new industrial and commercial buildings and hotel and lodging places.

In order to estimate what would occur to the regional economy if ranch lands were converted, the annual reduction of $36,373,940 in summer tourist spending was

152

incorporated into the IMPLAN model. Further, the model was shocked based on the percentages of expenditures for each category as stated by the respondents in the survey. It was estimated that tourists locally spend 9.7% of their expenditures on transportation, 46.6% on lodging, 35.0% on food and drink and 8.7% on entertainment activities. In addition, for the lodging expenditures, 77% was represented by hotel tourists and 23% was represented by camping tourists (Colorado State Parks, 2005; Evans Hall, 2006). These percentages were applied to the $36.4 million which resulted in reductions of spending as follows: $3,531,450 for transportation (NAICS = Auto Dealers and Service Stations), $13,052,241 for hotel lodging (NAICS = Hotel and Lodging Places), $3,898,721 for camping (NAICS = State and Local Government – Non-Education), $12,713,222 for food and drink (NAICS = Eating and Drinking) and $3,178,305 for entertainment activities (NAICS = Amusement and Recreation Services) if ranch lands were converted to urban uses. In addition, it is important to take into account the loss in agricultural activity due to the conversion of ranchland into urban uses. The survey questions asked behavior and values contingent on if existing ranchlands were converted to urban uses, therefore, it needs to be assumed that all agricultural activity will be lost in Routt County with this conversion. In IMPLAN, the hay and pasture sector ($10,030,000), the range fed cattle sector ($9,810,000) and the ranch fed cattle sector ($8,870,000) will represent the associated agricultural activity with Routt County's ranchlands. The industry output of agricultural activity will be obtained from the output levels under current land use conditions in IMPLAN. However, the level of agricultural activity will be reduced to zero with the evaluation of impacts to the region if existing

153

ranchlands were converted to urban uses. The top 25 industries negatively impacted by

employment and output can be seen in Table 4.16 and Table 4.17, respectively.

Table 4.16: Routt County Rural Loss Employment Impacts if Ranchlands were Converted to Urban Uses (in Number of Jobs)

Industry		Direct	Indirect	Induced	Total
454	Eating & Drinking	-337.99	-3.68	-26.58	-368.25
13	Hay and Pasture	-299.13	-11.10	-0.02	-310.26
463	Hotels and Lodging Places	-203.03	-1.67	-2.35	-207.06
4	Range Fed Cattle	-120.54	-39.57	-0.07	-160.19
3	Ranch Fed Cattle	-99.24	-12.34	-0.05	-111.63
523	State & Local Government - Non-Education	-97.99	0.00	0.00	-97.99
488	Amusement and Recreation Services-	-82.71	0.00	-4.99	-87.70
451	Automotive Dealers & Service Stations	-49.29	-0.25	-3.74	-53.28
455	Miscellaneous Retail	0.00	-0.53	-22.63	-23.15
56	Maintenance and Repair Other Facilities	0.00	-13.92	-3.16	-17.08
492	Hospitals	0.00	-0.03	-16.29	-16.32
462	Real Estate	0.00	-10.45	-4.64	-15.09
447	Wholesale Trade	0.00	-10.66	-4.08	-14.74
26	Agricultural- Forestry- Fishery Services	0.00	-12.85	-0.05	-12.90
490	Doctors and Dentists	0.00	0.00	-11.25	-11.25
457	Credit Agencies	0.00	-7.25	-3.61	-10.86
450	Food Stores	0.00	-0.10	-9.91	-10.01
493	Other Medical and Health Services	0.00	-2.26	-5.99	-8.24
456	Banking	0.00	-3.41	-3.66	-7.07
435	Motor Freight Transport and Warehousing	0.00	-5.35	-1.44	-6.79
470	Other Business Services	0.00	-5.23	-1.50	-6.73
464	Laundry- Cleaning and Shoe Repair	0.00	-2.99	-3.20	-6.19
452	Apparel & Accessory Stores	0.00	-0.09	-5.17	-5.26
475	Computer and Data Processing Services	0.00	-3.58	-1.51	-5.08
476	Detective and Protective Services	0.00	-3.48	-0.77	-4.26
TOTAL EMPLOYMENT IMPACT		-1,289.94	-191.10	-192.38	-1,673.42

The top five industries to be most negatively impacted with the number of jobs

contingent on if ranchlands were converted to urban uses are eating and drinking, hay and

pasture, hotels and lodging places, range fed cattle and ranch fed cattle. There would be a

loss of 1,673 jobs within Routt County, ceteris paribus, if ranchlands were converted into

urban uses. Therefore, one job lost in the directly affected industries translates into 0.30

jobs lost in the indirect and induced industries.

154

Table 4.17: Routt County Rural Loss Industry Output Impacts if Ranchlands were Converted to Urban Uses (in Millions of Dollars)

Industry		Direct	Indirect	Induced	Total
454	Eating & Drinking	-12,713,222	-138,448	-999,787	-13,851,457
463	Hotels and Lodging Places	-13,052,241	-107,277	-151,362	-13,310,880
4	Range Fed Cattle	-9,810,000	-3,220,471	-6,004	-13,036,475
13	Hay and Pasture	-10,030,000	-372,231	-779	-10,403,010
3	Ranch Fed Cattle	-8,870,000	-1,102,826	-4,600	-9,977,426
523	State & Local Government - Non-Education	-3,898,721	0	0	-3,898,721
451	Automotive Dealers & Service Stations	-3,531,450	-18,050	-267,885	-3,817,385
488	Amusement and Recreation Services	-3,178,305	0	-191,847	-3,370,152
462	Real Estate	0	-2,149,552	-953,892	-3,103,444
461	Owner-occupied Dwellings	0	0	-1,800,934	-1,800,934
447	Wholesale Trade	0	-1,294,641	-495,204	-1,789,845
456	Banking	0	-759,906	-817,188	-1,577,093
490	Doctors and Dentists	0	0	-1,143,905	-1,143,905
56	Maintenance and Repair Other Facilities	0	-914,587	-207,766	-1,122,352
492	Hospitals	0	-2,063	-1,064,544	-1,066,607
443	Electric Services	0	-506,751	-461,042	-967,793
435	Motor Freight Transport and Warehousing	0	-657,941	-177,432	-835,373
470	Other Business Services	0	-560,250	-161,031	-721,280
455	Miscellaneous Retail	0	-15,212	-654,770	-669,983
441	Communications- Except Radio and TV	0	-340,511	-295,419	-635,930
475	Computer and Data Processing Services	0	-375,059	-158,231	-533,290
512	Other State and Local Govt Enterprises	0	-198,436	-274,617	-473,053
450	Food Stores	0	-4,504	-436,352	-440,856
446	Sanitary Services and Steam Supply	0	-366,384	-66,401	-432,785
493	Other Medical and Health Services	0	-105,054	-278,549	-383,603
TOTAL OUTPUT IMPACT		-65,083,939	-16,513,094	-14,528,329	-96,125,363

Similar to the employment impacts, the top five industries with the largest negative industry output impacts are eating and drinking, hotels and lodging places, range fed cattle, hay and pasture and ranch fed cattle. Routt County's regional economy would experience a negative economic impact totaling $96.1 million if ranchlands were converted into urban uses, ceteris paribus. From the industry output impacts, the indirect

155

effects and induced effects multipliers can be calculated, which are 1.3 and 1.5, respectively. Therefore, for each dollar lost in direct sales, there is a $0.50 loss in indirect and induced sales.

For illustrative reasons, this research estimated the gain achieved with converting existing ranchlands to urban uses. Therefore, the following five sectors were given an additional ten percent increase in industry output: new residential structures (+ $16,140,000), hotel and lodging places (+ $6,160,000), eating and drinking (+ $5,610,000), amusement and recreation services (+ $5,570,000) and miscellaneous retail (+ $2,460,000). The top 25 industries positively impacted by employment and output can be seen in Table 4.18 and Table 4.19, respectively.

156

Table 4.18: Routt County Urban Gain Employment Impacts if Ranchlands were Converted to Urban Uses (in Number of Jobs)

Industry		Direct	Indirect	Induced	Total
454	Eating & Drinking	149.15	2.21	13.32	164.68
488	Amusement and Recreation Services	144.95	0.00	2.50	147.45
455	Miscellaneous Retail	85.02	8.88	11.34	105.24
48	New Residential Structures	101.27	0.00	0.00	101.27
463	Hotels and Lodging Places	95.82	1.18	1.18	98.19
447	Wholesale Trade	0.00	7.86	2.04	9.90
492	Hospitals	0.00	0.02	8.17	8.19
56	Maintenance and Repair Other Facilities	0.00	5.18	1.59	6.76
450	Food Stores	0.00	1.73	4.97	6.69
451	Automotive Dealers & Service Stations	0.00	4.25	1.87	6.13
462	Real Estate	0.00	3.47	2.33	5.80
490	Doctors and Dentists	0.00	0.00	5.64	5.64
457	Credit Agencies	0.00	3.51	1.81	5.31
435	Motor Freight Transport and Warehousing	0.00	4.56	0.72	5.29
470	Other Business Services	0.00	4.02	0.75	4.78
456	Banking	0.00	2.56	1.84	4.39
27	Landscape and Horticultural Services	0.00	3.44	0.71	4.15
452	Apparel & Accessory Stores	0.00	1.54	2.59	4.13
453	Furniture & Home Furnishings Stores	0.00	1.97	2.00	3.98
464	Laundry- Cleaning and Shoe Repair	0.00	1.91	1.60	3.51
475	Computer and Data Processing Services	0.00	2.61	0.76	3.37
448	Building Materials & Gardening	0.00	1.86	1.45	3.32
476	Detective and Protective Services	0.00	2.81	0.39	3.20
507	Accounting- Auditing and Bookkeeping	0.00	2.53	0.52	3.05
493	Other Medical and Health Services	0.00	0.00	3.00	3.00
TOTAL EMPLOYMENT IMPACT		576.20	96.75	96.43	769.39

The top five industries to be most positively impacted by number of jobs contingent if ranchlands were converted to urban uses is eating drinking, amusement and recreation services, miscellaneous retail, new residential structures and hotels and lodging places. There would be a gain of 769 jobs within Routt County which results in a net loss of 904 jobs when the rural losses are also taken into account. One job gained in the directly affected industries translates into 0.30 jobs gained in indirect and induced industries. The employment impact on indirect and induced industries for the rural loss and urban gain

157

models is the same. However, it is important to note the different industries impacted

under each model.

Table 4.19: Routt County Urban Gain Industry Output Impacts if Ranchlands were Converted to Urban Uses (in Millions of Dollars)

Industry		Direct	Indirect	Induced	Total
48	New Residential Structures	16,140,000	0	0	16,140,000
463	Hotels and Lodging Places	6,160,000	76,123	75,874	6,311,997
454	Eating & Drinking	5,610,000	83,226	501,171	6,194,397
488	Amusement and Recreation Services	5,570,000	0	96,169	5,666,169
455	Miscellaneous Retail	2,460,000	256,870	328,222	3,045,092
447	Wholesale Trade	0	954,026	248,235	1,202,261
462	Real Estate	0	714,176	478,165	1,192,341
456	Banking	0	570,224	409,638	979,863
461	Owner-occupied Dwellings	0	0	902,769	902,769
435	Motor Freight Transport and Warehousing	0	561,132	88,943	650,075
490	Doctors and Dentists	0	0	573,415	573,415
492	Hospitals	0	1,569	533,633	535,202
470	Other Business Services	0	431,180	80,721	511,902
443	Electric Services	0	249,158	231,110	480,268
56	Maintenance and Repair Other Facilities	0	340,338	104,148	444,487
451	Automotive Dealers & Service Stations	0	304,778	134,285	439,062
441	Communications- Except Radio and TV	0	264,273	148,087	412,360
475	Computer and Data Processing Services	0	273,817	79,318	353,135
450	Food Stores	0	76,049	218,734	294,783
473	Equipment Rental and Leasing	0	225,434	15,278	240,712
512	Other State and Local Govt Enterprises	0	93,879	137,660	231,539
446	Sanitary Services and Steam Supply	0	189,082	33,286	222,367
448	Building Materials & Gardening	0	109,637	85,530	195,168
506	Engineering- Architectural Services	0	178,287	11,710	189,997
453	Furniture & Home Furnishings Stores	0	92,832	94,195	187,027
	TOTAL OUPUT IMPACT	35,940,000	8,285,931	7,282,733	51,508,663

Similar to the employment impacts, the top five industries with the largest

positive industry output impacts are new residential structures, hotels and lodging places,

eating and drinking, amusement and recreation services and miscellaneous retail. Routt

County's regional economy would experience a positive economic impact totaling $51.5

million, which results in a net loss of $44.6 million when the rural losses are taken into

account. For the urban gain output impacts, the indirect and induced effects multipliers

158

are calculated to be 1.2 and 1.4, respectively. While the multipliers are very similar across both models, it is important to further examine the impacted industries for policy relevant decisions.

It is important to note that the urban gain portion of this research was developed for illustrative reasons. Further research needs to be conducted in order to capture the true impact the conversion of ranchlands would have on the Routt County economy. The nonconsumptive use value of winter tourists and residents to Routt County are not included in this research. In addition, whether the urban development is residential or commercial could have potentially different impacts on the economy. However, residential development would lead to an increase in household spending while an increase in commercial development would increase spending in retail sales, for example. Depending on the form of development, the impact on the region could be substantially different. While the conversion of ranchlands may provide additional economic benefits to the economy, it would lead to losses in the ranching and farming sector. For further research considerations, it would be important to weigh the benefits and costs associated with the conversion of the ranch open space to determine the winners and losers within the Routt County economy.

4.6: Conclusion

The average Routt County summer tourist is a 45-year-old male with a college degree and an annual household income ranging from $100,000 to $129,999. The majority of tourists are United States residents and half of the tourists are from within the state of Colorado.

Tourists stated that the natural environment, ranch open space, western historical preservation and recreation amenities strongly add to their trip experience in the Steamboat Springs area. Community services and urban development are the lowest rated Steamboat Springs area amenities that add to a tourist's trip experience. Of the reasons for protecting ranch open space in Routt County, the highest values were placed on protection of working ranches, potential ranch open space viewing of upcoming generations and private enterprise to maintain agriculture as part of the local economy.

Visitors to the Steamboat Springs area expected to stay an average of approximately eleven days spanned over almost 3 trips during 2005. Respondents spend six and half hours traveling almost 860 miles one way to Steamboat Springs. While in the Steamboat Springs area, the majority of tourists hike or walk, shop, goes sightseeing or takes photographs, or drive for pleasure as their primary summer activities. Less than 10% of the tourists visit a ranch. However, nearly half the respondents have visited a western ranch. Of the total expenditures spent on their current trip to the Steamboat Springs area, 83.3% of spending occurs within Routt County. The typical visitor spends an average of $153 per day in the local economy with the majority of expenditures attributed to lodging and food and drink.

If the cost of traveling were to increase, regardless of development on existing ranch lands, respondents would reduce the length of their trip to the Steamboat Springs area. However, if ranch lands were to be converted to urban uses, half of the respondents stated they would reduce their expenditure level by $70 per person per day and reduce their trip length by approximately three days. Compared to the 1993 summer survey results, support for preserving ranch open space in Routt County has increased from 25%

160

to 50% of tourists stating they would reduce their travel to the Steamboat area if ranch open space were converted to urban uses. This proves to imply large potential losses to the Steamboat Springs area economy, equating approximately $29 million, annually in net loss of direct sales including the loss of agricultural activity. The conversion of ranchland open space results in a net economic loss of $15.4 million in indirect and induced sales. Further, if ranchlands were converted to urban uses, ceteris paribus, Routt County would experience a net loss of 904 jobs. Therefore, for regional policy analysis, the nonconsumptive use values of such natural amenities, such as ranchland open space need to be taken into serious consideration.

REFERENCES

Bennett, D.Gordon 1996. "Implication of Retirement Development in High-Amenity Nonmetropolitan Coastal Areas." *Journal of Applied Gerontology,* 15: 345-360.

Cohen Erik 1979. "A Phenomenology of Tourist Experiences." *Journal of the British Sociological Association,* 13: 179-201.

Colorado State Parks. 2005. *Steamboat Lake State Park FY04-05 Park Facts.* Accessed at http://www.parks.state.co.us/home/publications/Fact_Sheets/0405_Fact_Sheet/Steamboat_06.pdf. Accessed on May 22, 2006.

Colorado State Parks. 2005. *Stagecoach State Park FY04-05 Park Facts.* Accessed at http://www.parks.state.co.us/home/publications/Fact_Sheets/0405_Fact_Sheet/Stagecoach_06.pdf. Accessed on May 22, 2006.

Cottrell, Stuart P., Jaap Lengkeek and Ramona van Marwijk. 2005. "Typology of Recreation Experiences: Application in a Dutch Forest Service Visitor Monitoring Survey." *Managing Leisure,* 10(1): 54-72.

Elands, Birgit H.M. and Jaap Lengkeek. 2000. *Typical Tourists: Research into the Theoretical and Methodological Foundations of a Typology of Tourism and Recreation Experiences.* Leiden, The Netherlands: Backhuys Publishers.

Evans Hall, Sandy. Steamboat Springs Chamber of Commerce. Conversation on May 22, 2006.

Frederick, Martha. 1993. "Rural Tourism and Economic Development." *Economic Development Quarterly,* 7: 215-224.

Greene, William H. 2003. *Econometric Analysis.* 5th ed. Upper Saddle River, NJ: Prentice Hall.

Jakus, Paul Mark, Paul B. Siegel and Richard L. White. Fall 1995. "Tourism as Rural Development Strategy: Finding Consensus in Residents' Attitudes." *Tennessee Agricultural Science,* 22-29.

Keith, John and Christopher Fawson. 1995. "Economic Development in Rural Utah: Is Wilderness Recreation the Answer?" *Annals of Regional Science,* 29: 303-313.

162

Keith, John, Christopher Fawson and Tsangyao Chang. 1996. "Recreation as an Economic Development Strategy: Some Evidence from Utah." *Journal of Leisure Research,* 28: 96-107.

Kiker, Clyde and Alan W. Hodges. December 2002. "Economic Benefits of Natural Land Conservation: Case Study of Northeast Florida." Final Report Submitted to Defenders of Wildlife in Fulfillment of Sponsored Project Agreement. 70pgs.

Lengkeek, Jaap. 2001. "Leisure Experience and Imagination: Rethinking Cohen's Modes of Tourist Experience." *International Sociology,* 16(2): 173-184.

Lengkeek, Jaap. 2000. "Imagination and Differences in Tourist Experience." *World Leisure,* 3: 11-17.

Loomis, John, Lindsey Ellingson, Armando Gonzalez-Caban and Andy Seidl. July 2006. "The Role of Ethnicity and Language in Contingent Valuation Analysis: A Fire Prevention Policy Application." *The American Journal of Economics and Sociology,* 65(3): 559-586.

Loomis, John B. February 1989. "Test-Retest Reliability of the Contingent Valuation Method: A Comparison of General Population and Visitor Responses." *American Journal of Agricultural Economics,* 71(1): 76-84.

Maddala, G.S. 1996. *Limited Dependent and Qualitative Variables in Econometrics.* Cambridge University Press.

Magnan, Nicholas. Fall 2005. "The Economic Value of Ranch Open Space to Residents: A Contingent Valuation Study of Changes Over the Past Decade." Master's Thesis, Department of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO: 112 pgs.

Magnan, Nick and Andy Seidl. June 2004. "Community Economic Considerations of Tourism Development." Department of Agricultural and Resource Economics, Cooperative Extension, Colorado State University. June 2004-EDR 04-06.

Marcouiller, David W. 1998. "Environmental Resources as Latent Primary Factors of Production in Tourism: The Case of Forest-Based Commercial Recreation." *Tourism Economics,* 4: 131-145.

Marcouiller, David W. 1997. "Toward Integrative Tourism Planning in Rural America." *Journal of Planning Literature,* 11: 337-357.

Marcouiller, David W. and Greg Clendenning. 2005. "The Supply of Natural Amenities: Moving from Empirical Anecdotes to a Theoretical Basis." In Gary Paul Green, Steven C. Deller and David W. Marcouiller (Eds.), *Amenities and Rural*

163

Development: Theory, Methods and Public Policy (pp. 6-32). Northampton, MA: Edward Elgar Publishing, Inc.

McDonough, M., J. Fried, K. Potter-Witter, J. Stevens and D. Stynes. 1999. "The Role of Natural Resources in Community and Regional Economic Stability in the Eastern Upper Peninsula." Research Report 568, Michigan Agricultural Experiment Station, Michigan State University.

Power, Thomas Michael. 2005. "The Supply and Demand for Natural Amenities: An Overview of Theory and Concepts." In Gary Paul Green, Steven C. Deller and David W. Marcouiller (Eds.), *Amenities and Rural Development: Theory, Methods and Public Policy* (pp. 63-77). Northampton, MA: Edward Elgar Publishing, Inc.

Power, Thomas Michael. 1988. *The Economic Pursuit of Quality,* Armonk, NY: M.E. Sharpe.

Reiling, Stephen D., Kevin J. Boyle, Marcia L. Phillips and Mark W. Anderson. May 1990. "Temporal Reliability of Contingent Values." *Land Economics,* 66(2): 128-134.

Rosenberger, Randall S. and John B. Loomis. Summer 1999. "The Value of Ranch Open Space to Tourists: Combining Observed and Contingent Behavior Data." *Growth and Change.* 30: 366-383.

Stynes, Daniel. 1999a. "Approaches to Estimating the Economic Impacts of Tourism: Some Examples." Michigan State University. Working Paper. 18 pgs.

Stynes, Daniel. 1999b. "Economic Impacts of Tourism." Michigan State University. Working Paper. 17 pgs.

Wall, Geoffrey. 1997. "Sustainable Tourism - Unsustainable Development." In Salah Wahab and John J. Pigram (Eds.), *Tourism Development and Growth: The Challenge of Sustainability* (pp. 33-49). New York: Routledge.

CHAPTER 5: CONCLUSION

Tourists' experience does not only encompass the activities that they actively partake in, but in their surroundings of their tourist destination. Alterations of these surroundings could either increase or decrease the amount of tourism activity in the specified area. This would have an impact on the local economy contiguous to the tourist destination. Therefore, policies that either directly or indirectly affects the tourism industry need to take into account how the surroundings may influence a tourist's experience because of the potential impact this could have on the local economy. Not capturing the nonconsumptive use values associated with tourism underestimates the impacts tourism has on the local economy which could lead to significantly different policy decisions. The objective of this research reported is to discover tourists' nonconsumptive use values associated with varying forms of development both domestically and internationally.

The results for Eduardo Avaroa Reserve in Bolivia show that visitors' willingness to pay contingent on park management improvements is greater than what they are currently being charged. In order to examine the difference between the two samples (contingent valuation and contingent behavior), the likelihood ratio test was used to compare the significance between the coefficients of the regressions. The regressions between the two samples were found to be theoretically similar but statistically different.

165

A significant difference between willingness to pay for the contingent behavior scenario versus contingent behavior scenario was identified; the willingness to pay under the contingent behavior scenario is greater than the willingness to pay under the contingent valuation scenario. Further, the elasticity with respect to the bid amount is less inelastic in the contingent behavior scenario than the contingent valuation scenario, which leads to a $300,000 annual difference in total expected expenditure impacts.

Theoretically, both valuation techniques provide similar results. However, with further econometric testing it was shown that the two non-market valuation techniques provide different statistical results. Further research needs to be conducted in order to determine whether one valuation technique is superior. In the case of valuation of Eduardo Avaroa Reserve, the statistical differences in willingness to pay responses lead to financially important differences in predicted fee levels, visitation levels and revenues. The results produce a large divergence in expected economic impacts across the two non-market valuation methods. Therefore, in developing countries, it is advisable to employ more than one non-market valuation technique toward the support of any protected area.

In the second chapter, the likely economic impact of potential infrastructure development along a scenic roadway between El Calafate and Glaciers National Park in Argentine Patagonia was examined. Although economic valuation of scenic viewscapes has some history in the United States, this is the first study of this kind undertaken in Argentina to our knowledge. Moreover, relatively few studies have been conducted in regards to economic valuation of scenic roadways.

In general, it was discovered that the natural environment was very important to all visitors' enjoyment of their visit to El Calafate. Foreign visitors to the region are

166

wealthier; somewhat more educated, and spend more than Argentines and that people on tours spend less locally than independent travelers. In addition, people on tours spend less time in the region than independent travelers and that travelers would prefer to spend some 1-2 additional days in the El Calafate region. Further, tours often include local and non-local transportation, lodging and excursions and these expenditures do not typically find their way to the local economy.

The low willingness to pay to avoid the potential development scenarios should not be completely dismissed. While, it is a small portion of the individual's expenditure, it still proves to have a significant impact to the regional economy which is financially important for policy decisions. The total annual local economic impact of tourist visits to Glaciers National Park was approximately $85.2 million and the potential amount to be raised for the local tourism economy to leave the area undeveloped at as much as $4.5 million per year. Furthermore, even among those who were not willing to pay to preserve the undeveloped nature of the roadway, respondents overwhelmingly indicated a preference for an unfettered view over a more developed view.

The empirical results conclude that there is a statistical significance in the survey elicitation language which coincides with what Loomis *et al.* (2006) concluded. In addition, it was concluded that the tour package purchase decision did not have a statistical difference on whether the tourist would visit the region or their maximum willingness to pay, contingent on proposed development. However, survey elicitation language still needs to be employed in so much that it would leave out a huge portion of a sample in an international tourist destination. In addition, not factoring tour package

167

purchases into economic analysis could lead to drastically different regional impacts important for policy analysis.

In the application pertaining to converting ranch lands to urban uses for Routt County, the average summer tourist is a 45-year-old male with a college degree and an annual household income ranging from $100,000 to $129,999. The majority of tourists are United States residents and half of the tourists are from within the state of Colorado.

Tourists stated that the natural environment, ranch open space, western historical preservation and recreation amenities strongly add to their trip experience in the Steamboat Springs area. Community services and urban development are the lowest rated Steamboat Springs area amenities that add to a tourist's trip experience. Of the reasons for protecting ranch open space in Routt County, the highest values were placed on protection of working ranches, potential ranch open space viewing of upcoming generations and private enterprise to maintain agriculture as part of the local economy.

Visitors to the Steamboat Springs area expected to stay an average of approximately eleven days spanned over almost 3 trips during 2005. Respondents spend six and half hours traveling almost 860 miles one way to Steamboat Springs. While in the Steamboat Springs area, the majority of tourists hikes or walks, shops, sightsees or takes photographs, or drive for pleasure as their primary summer activities. Less than 10% of the tourists visit a ranch. However, nearly half the respondents have visited a western ranch. Of the total expenditures spent on their current trip to the Steamboat Springs area, 83.3% of spending occurs within Routt County. The typical visitor spends an average of $153 per day in the local economy with the majority of expenditures attributed to lodging and food and drink.

If the cost of traveling were to increase, regardless of development on existing ranch lands, respondents would reduce the length of their trip to the Steamboat Springs area. However, if ranch lands were to be converted to urban uses, half of the respondents stated they would reduce their expenditure level by $70 per person per day and reduce their trip length by approximately three days. The results show that the respondents are more price sensitive (percentage change in willingness to pay) than in changing their travel behavior if ranch lands were converted to urban uses.

Compared to the 1993 summer survey results, support for preserving ranch open space in Routt County has increased from 25% to 50% of tourists stating they would reduce their travel to the Steamboat area if ranch open space were converted to urban uses. This proves to imply large potential net losses to the Steamboat Springs area economy, equating approximately $29 million in direct spending including the loss of agricultural activity, annually with an additional net loss of $15.4 million to the economy in indirect and induced sales and a net loss of 904 jobs.

In summary, it was concluded that nonconsumptive use values do have a significant impact on land use conversions and should be further researched when considering altering viewscapes in tourist attractive regions.

APPENDICES

APPENDIX IIA: EDUARDO AVAROA RESERVE CONTINGENT BEHAVIOR SURVEY

171

Interviewer use only

Date _____ Interviewer _____ Survey No. _____ Version CB-1

Self completed_____ OR Administered by interviewer_____ Location _____

Reserva
Eduardo Avaroa

Visitor Survey

The
Nature
Conservancy®
Saving the Last Great Places

Conducted by
The Nature Conservancy

This survey is **voluntary, anonymous**, and completely **confidential**. Please answer all of the questions. If anything is unclear, please ask the interviewer who gave you the survey. Thank you for your participation!

172

1. Please circle the appropriate number to indicate whether you are completing this survey as an individual or as a couple or family. If you are a couple/family, please write how many people are in your family group.

    1. As an individual

    2. As a couple/family – there are _____ of us traveling together as a couple/family (for the following questions, when we say "you" or "I" we are referring to your family group)

2. Next, we'd like to find out more about your current trip. By "trip," we mean the period from when you left your home (usual place of residence) to when you will return home.

How many days will you spend...	Days
a. ￫in total on this trip	
b. ￫in Latin America	
c. ￫in Bolivia	

3. During the days you are spending in Bolivia~~this trip~~, are you traveling as part of a tour package (booked with an operator or travel agent), traveling independently, or some of both?

    1. I am traveling as part of a tour package for the whole ~~trip~~time in Bolivia

    2. I am traveling independently for the whole ~~trip~~time in Bolivia

    3. For some of the ~~trip~~time in Bolivia I am traveling as part of a tour package and for some I am traveling independently. Please write how many days you are spending:

    a. as part of a tour package _____ days **and** b. traveling independently _____ days

4. Approximately how much money will you spend in total for your time in Bolivia ~~on this trip~~ – including airfare (if you are flying to/from Bolivia), accommodation, food, souvenirs, and other expenses? If you are traveling as part of a tour package, include both the cost of the package and the cost of any items not included in the package – if the package covers travel both in Bolivia and elsewhere, please estimate how much of the cost is for the Bolivia portion.

____Please specify the amount and currency (for example, US$, euros, £, or bolivianos).

Individuals:
    I will spend approximately: _____

Couples/families:
    We will spend approximately: _____ per person

173

or

We will spend approximately: _____ total for _____ persons

174

5. In question 2, you wrote how many days you will spend in Bolivia and in Latin America as a whole. In the following table, please write how many days in total *during this trip* you will spend in Eduardo Avaroa Reserve, how many days in other Bolivian nature reserves or parks, and how many days in nature reserves or parks outside of Bolivia. (If you do not know the exact number of days, please write your best estimate.)

Area	Days
a. Eduardo Avaroa	
b. Other nature reserves or parks in Bolivia	
c. Nature reserves or parks in other countries	

6. In Eduardo Avaroa, the Bolivian Park Service charges visitors US$5 (€5) per person to pay for protecting the reserve (the fee is only paid once, regardless of how ~~long~~ many days you stay). The Park Service may decide to charge a higher fee – with money being used to improve visitor services and facilities. For example, the income would be used to build and maintain a visitor center and to train local naturalist guides.

This fee would increase the cost of your visit, as operators would add it to your tour price. We would like to know how this would affect your trip. Please assume that the fee changes only at Eduardo Avaroa – not at other parks.
If the trip price had been US$10 (€10) higher than what you paid, what would you have done? ~~(Please assume that the fee changes only at Eduardo Avaroa – not at other parks.~~(Please circle the appropriate number and proceed as indicated.)

1. I would have kept the same itinerary of visiting parks, as shown in Question 5 → *please skip Question 7 and continue with Question 8.*

2. I would have made a different itinerary of visiting parks → *please complete Questions 7 and 8*

3.   I would not have visited any parks → please skip Question 7 and continue with Question 8

7.   Please indicate the itinerary you would have had *if the above fee had been in place* by writing how many days you would have spent in each of the following areas.

Area	Days
a. Eduardo Avaroa	
b. Other nature reserves or parks in Bolivia	
c. Nature reserves or parks in other countries	

175

8. ——What is the maximum fee, in addition to the current US$5 (€5), you would be willing to pay to visit Eduardo Avaroa Reserve (and its lakes) before deciding to change your itinerary —or to cancel your trip altogether?

      US$ (€) _____ per person

176

Lastly, we'd like to learn more about the characteristics of people that visit Eduardo Avaroa Reserve. All responses are confidential, and we will not ask your name or anything else to identify you.

For questions 9 through 12, please answer only for yourself, even if you are completing the survey as a couple or family.

9. Where do you live? **(Please circle the appropriate number.)**
   1. ~~Bolivia~~United Kingdom
   2. Germany~~Chile~~
   3. United States~~Argentina~~
   4. France~~Germany~~
   5. Netherlands~~United States~~
   6. Switzerland
   7. Another country – please write the name of your country _____

10. What is your gender?
    1. Female
    2. Male

11. What is your age?
    1. Under 18 years
    2. 18 - 29 years
    3. 30 - 39 years
    4. 40 - 49 years
    5. 50 - 59 years
    6. 60 years or over

12. What is your highest level of completed education?

1. Primary school
2. High school (diploma)
3. Undergraduate college/university
4. Graduate (e.g., Masters or Ph.D.)

13. **What is your pre-tax income per year** *from all sources*? **Those answering as** *individuals* **should circle the number that shows their individual income.** *Couples/families* **should circle the number that shows their combined household income.**

   a. If you know your annual income in US$ (US dollars) or in € (euros), please circle the relevant number from this list:
   1. Less than 20,000
   2. 20,000 to 39,999
   3. 40,000 to 59,999
   4. 60,000 to 79,999
   5. 80,000 to 99,999
   6. 100,000 to 119,999
   7. 120,000 to 139,999
   8. 140,000 or above

   b. If you do not know your income in US$ or €, please write the name of the currency and the amount in the following spaces:

   Currency name: _____   Amount: _____

Thank you for completing this survey! If you have any further comments about the Eduardo Avaroa Reserve, your guide, or other aspects of your visit, please write them on the back of this page. When you are finished, please hand the survey back to the interviewer.

177

APPENDIX IIB: EDUARDO AVAROA RESERVE CONTINGENT VALUATION SURVEY

Interviewer use only

Date _____   Interviewer _____   Survey No. _____ Version CV-1

Self completed_____ OR Administered by interviewer_____ Location _____

Reserva
Eduardo Avaroa

Visitor Survey

Conducted by
The Nature Conservancy

This survey is **voluntary, anonymous**, and completely **confidential**. Please answer all of the questions. If anything is unclear, please ask the interviewer who gave you the survey. Thank you for your participation!

179

1. Please circle the appropriate number to indicate whether you are completing this survey as an individual or as a couple or family. If you are a couple/family, please write how many people are in your family group.

    1. As an individual

    2. As a couple/family – there are _____ of us traveling together as a couple/family (for the following questions, when we say "you" or "I" we are referring to your family group)

2. **Next, we'd like to find out more about your current trip. By "trip," we mean the period from when you left your home (usual place of residence) to when you will return home.**

How many days will you spend...	Days
a. in total on this trip	
b. in Latin America	
c. in Bolivia	

3. During the days you are spending in Bolivia, are you traveling as part of a tour package (booked with an operator or travel agent), traveling independently, or some of both?

    1. I am traveling as part of a tour package for the whole time in Bolivia

    2. I am traveling independently for the whole time in Bolivia

    3. For some of the time in Bolivia I am traveling as part of a tour package and for some I am traveling independently. Please write how many days you are spending:

       a. as part of a tour package _____ days **and** b. traveling independently ___ days

4. Approximately how much money will you spend in total for your time in Bolivia – including airfare (if you are flying to/from Bolivia), accommodation, food, souvenirs, and other expenses? If you are traveling as part of a tour package, include both the cost of the package and the cost of any items not included in the package – if the package covers travel both in Bolivia and elsewhere, please estimate how much of the cost is for the Bolivia portion.

    Please specify the amount <u>and</u> currency (for example, US$, euros, £, or bolivianos).

    Individuals:
    I will spend approximately: _____

    Couples/families:
    We will spend approximately: _____ per person
    or
    We will spend approximately: _____ total for _____ persons

180

5. **In question 2, you wrote how many days you will spend in Bolivia and in Latin America as a whole. In the following table, please write how many days in total** *during this trip* **you will spend in Eduardo Avaroa Reserve, how many days in other Bolivian nature reserves or parks, and how many days in nature reserves or parks outside of Bolivia.** (If you do not know the exact number of days, please write your best estimate.)

Area	Days
a. Eduardo Avaroa	
b. Other nature reserves or parks in Bolivia	
c. Nature reserves or parks in other countries	

7. In Eduardo Avaroa, the Bolivian Park Service charges visitors US$5 (€5) per person to pay for protecting the reserve (the fee is only paid once, regardless of how many days you stay). The Park Service may decide to charge a higher fee – with money being used to improve visitor services and facilities. For example, the income would be used to build and maintain a visitor center and to train local naturalist guides. **This fee would increase the cost of your visit, as operators would add it to your tour price. We would like to know how this would affect your trip. Please assume that the fee changes only at Eduardo Avaroa – not at other parks.**
If the trip price had been US$10 (€10) higher than what you paid, would you still have come to the reserve? (Please circle the appropriate number.)

    3. Yes, I would still have come to Eduardo Avaroa.

    4. No, I would not have come to Eduardo Avaroa (I would have gone elsewhere or not visited parks).

Lastly, we'd like to learn more about the characteristics of people that visit Eduardo Avaroa Reserve. All responses are confidential, and we will not ask your name or anything else to identify you.

For questions 7 through 10, please answer only for yourself, even if you are completing the survey as a couple or family.

7. Where do you live? **(Please circle the appropriate number.)**
    1. United Kingdom   4. France
    2. Germany   5. Netherlands
    3. United States   6. Switzerland
    7. Another country – please write the name of your country _____

8. What is your gender?

    1. Female   2. Male

181

9. What is your age?

1. Under 18 years
2. 18 - 29 years
3. 30 - 39 years

4. 40 - 49 years
5. 50 - 59 years
6. 60 years or over

10. What is your highest level of completed education?

1. Primary school
2. High school (diploma)

3. Undergraduate college/university
4. Graduate (e.g., Masters or Ph.D.)

11. What is your pre-tax income per year *from all sources*? Those answering as *individuals* should circle the number that shows their individual income. *Couples/families* should circle the number that shows their combined household income.

a. If you know your annual income in US$ (US dollars) or in € (euros), please circle the relevant number from this list:

1. Less than 20,000
2. 20,000 to 39,999
3. 40,000 to 59,999
4. 60,000 to 79,999

5. 80,000 to 99,999
6. 100,000 to 119,999
7. 120,000 to 139,999
8. 140,000 or above

b. If you do not know your income in US$ or €, please write the name of the currency and the amount in the following spaces:

Currency name: _____   Amount: _____

Thank you for completing this survey! If you have any further comments about the Eduardo Avaroa Reserve, your guide, or other aspects of your visit, please write them on the back of this page. When you are finished, please hand the survey back to the interviewer.

182

APPENDIX IIIA: MAP OF ARGENTINE PATAGONIA
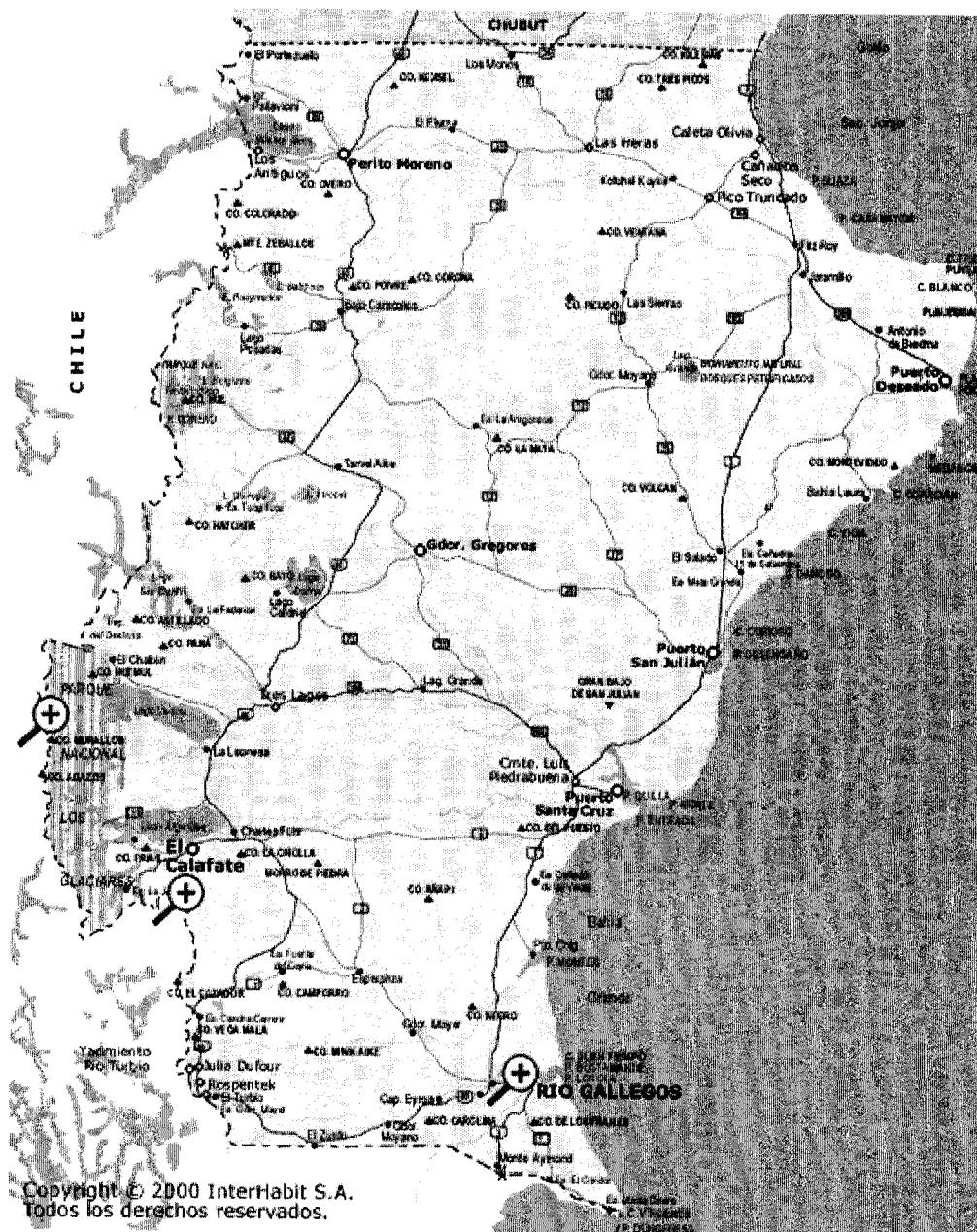
183

184

APPENDIX IIIB: SCENIC ROADWAY, ARGENTINA SURVEY (ENGLISH VERSION)

185

INCAE
BUSINESS SCHOOL

Leadership for Sustainable Development

FUNDACIÓN
NATURALEZA
PARA EL FUTURO

The Calafate/Perito Moreno Glacier Scenic Roadway Valuation Project

The Nature for the Future Foundation (FUNAFU) and the Central American Institute for Business Administration (INCAE) are responsible for this study of tourism in the Calafate/Glaciers National Parkregion, conducted within the context of a project for protecting the natural and cultural value of scenic landscapes. You have been selected from among the region's visitors to provide information about your trip and your preferences for development along the region's highway system. It should take you approximately 10 minutes to complete this survey. The information you provide will be very helpful for strategic planning in the area.

Your participation is voluntary, confidential and the information you provide will only be reported in an aggregated form. You will not be contacted or receive any mail due to your participation.

If you have any questions or comments on research project, please contact Dr. Andrew Seidl, Instituto Centroamericano de Administracion de Empresas (INCAE), La Garita, Alajuela, Costa Rica. T: 506-437-23-76; F: 506-433-91-01; E: Andrew.Seidl@incae.edu or Fundación Naturaleza para el Futuro (FUNAFU), Viamonte 1167 piso 11. Capital Federal (1053) Argentina. Tel/Fax: 5411-4373-5200; Email:info@funafu.org (www.naturalezaparaelfuturo.org).

Thank you for your participation in this research.

186

I. Please tell us about your trip.

1) Are you traveling as *(circle one):*
        a) an individual;
        b) in a couple;
        c) as a family;
        d) in a group.

If c) or d), there are _____ people traveling together as a family or group.

2) How many days will you spend...

        *...in Total on this trip? _____ (from when you left your home until you return home)
        ...in Argentina? _____
        *...in the El Calafate/Glaciers National Park region? _____

3) How many times have you visited El Calafate/Glaciers National Park? (check one)

_____ This is the first time
_____ 2 times
_____ 3-5 times
_____ 6-10 times
_____ 11 times or more

4) Please check the activities you participated in *during this most recent trip* to the El Calafate area.
(check all that apply).

_____ Horseback riding	_____ Mountain/rock climbing
_____ Hiking/walking/trekking	_____ Boating
_____ Bicycling/Mt. Biking	_____ Pleasure driving
_____ Snowshoeing	_____ Visiting a Patagonian ranch
_____ Hunting/fishing	_____ Visiting Perito Moreno Glacier
_____ Photography	_____ Visiting other glaciers
_____ Wildlife and flora viewing	_____ Visiting El Chalten
_____ Viewing scenic landscapes	_____ Other, please describe
_____ Camping	_____

5) Are there activities that you would like to enjoy in El Calafate, but were unable to?
_____ Yes _____ No
If yes, please specify _____

6) Please indicate your general level of satisfacion with you stay in the El Calfate area. (from 1 to 5)

Completely safisfied		Satisfied		Not at all satisfied
5	4	3	2	1

187

7) If you could plan your trip again, how many additional nights would you have stayed in the El Calafate? (Select one. A negative number means that many **fewer** nights)

-2   -1   0   1   2   3   4   5   Other _____

8) What were your two **most positive** experiences during your stay in the El Calafate area?

_____

_____

9) What were your two **most negative** experiences during your stay in the El Calafate area?

_____

_____

Please rate the importance of the following natural and human attributes and activities in your decision to visit El Calafate.

Please circle one number for each item	Importance to your visit to El Calafate, Argentina				
	Very Important				Irrelevant (Very unimportant)
Lakes and rivers	5	4	3	2	1
Glaciers/iceflows	5	4	3	2	1
Viewing wildlife (flora and fauna)	5	4	3	2	1
Mountain landscapes	5	4	3	2	1
Outdoor recreation opportunities (trekking, hiking, running, climbing, etc), **not** hunting & fishing	5	4	3	2	1
Hunting and fishing	5	4	3	2	1
Photography	5	4	3	2	1
Cleanliness or lack of pollution	5	4	3	2	1
Solitude or lack of crowds	5	4	3	2	1
Contact with nature	5	4	3	2	1
Entertainment or nightlife	5	4	3	2	1
Communication/ transportation infrastructure (e.g., internet, roads, phones)	5	4	3	2	1
High quality lodging	5	4	3	2	1
Reasonable prices	5	4	3	2	1
Other (specify_____)	5	4	3	2	1

188

III. Trip expenditures

*1) Is your visit to Calafate part of a package tour? _____ Yes _____ No

*If yes, what is the total cost of the package _____ **(US$, Argentine Pesos, or Euros).**
...what other locations/destinations does the tour include?:

_____

*2) How many days will you be on the tour in total: _____days (including travel time)?

*3) Please record the amount you or your group spent to visit to the El Calafate region on your most recent trip for the following items. If your tour includes a particular cost category, please check the appropriate box.

Please circle your intended currency of response: **(US$, Argentine Peso, or Euro)**

Trip Expense	Included in Package? (Check if 'yes')	Total Spent on your trip to, or stay in, the El Calafate/Los Glaciares region (If you are not traveling as part of a package, put total amount spent. If you are traveling as part of a package, please put additional amount spent beyond what package covers)
Transport to El Calafate (circle one: plane, bus, train, own car, rental car, other _____)		
Transport in the El Calafate region (circle one: bus, own car, rental car, other _____)		
Lodging		
Food & beverages		
Tours/excursions, including guides		
Souvenirs/gifts		
Entry fees and licenses		
Equipment rental		
Other_____		
TOTAL		

*4) How many people are accounted for with these expenditures? _____ person(s).

*5) As you know, some of the costs of travel have been increasing (fuel prices, park fees, taxes). What is the maximum increase in per trip costs you would have been willing to absorb and **still** visit the El Calafate area? (Please circle one: **per person, for entire group**) (Please circle one: **US$, Argentine Peso, Euro**)

$0 $10 $25 $50 $100 $250 $500 $750 $1000 $1500 $2000 $3000 $5000

189

IV. How would your visitation change with changes in land use?

El Calafate is the gateway community to Glaciers National Park, a UNESCO World Heritage site, laying some 80 km to the West of town along Provincial Highway #11. Due to the popularity of the Park and the unique natural Provincial Highway #11 between Calafate and Glaciers National Park currently offers an open view of the snow-capped mountains, traditional wildlife, farms and ranches and the rugged Patagonian landscape. However, in the near future this roadway may see various types of development that would alter the view. Please evaluate the following three visual representations of these development scenarios relative to the current view. Please do not make any assumptions about the relative cost of alternatives. Simply assess the relative contribution of the quality of roadway views to your visit.

For each of the scenarios below, please indicate:

1) Whether you would still have visited El Calafate if the road to Perito Moreno Glacier were developed as shown.
2) Whether you would recommend El Calafate to a friend or acquaintance if the road to Perito Moreno Glacier were developed as shown.
3) The maximum you would be willing to pay for each round trip from Calafate to Perito Moreno Glacier to **avoid** seeing the development as shown. Please enter the appropriate value from among the following for each scenario.

$0 $1 $2 $3 $5 $10 $15 $20 $25 $50 $75 $100 Other

Please circle whether your response to questions 3 is in **US$, Argentine Pesos, or Euros**.

Development Scenario	Visit? (1)	Recommend? (2)	Max WTP (3)
*Scenario I	(Yes, No)	(Yes, No)	
*Scenario II	(Yes, No)	(Yes, No)	
*Scenario III	(Yes, No)	(Yes, No)	

4) If you answered "WTP=$0" for any of the scenarios above, do you prefer the developed view over the undeveloped view? (Yes, No)

5) Do you feel that the landowners along the road from El Calafate to Perito Moreno Glacier should be able to develop their lands (resource extraction, develop infrastructure, etc) in any way they see fit? (Yes, No)

7) Do you believe that the municipal, or national government should act to preserve the view along the road to Perito Moreno Glacier using zoning or other regulatory means? (Yes, No)

8) Do you believe that the municipal or national government should act to preserve the view along the road to Perito Moreno Glacier by paying landowners or providing other incentives to landowners to maintain the view as it is? (Yes, No)

190

V. Please tell us something about yourself.

These last few questions will help us in evaluating how well our sample represents visitors. Your answers will be kept strictly confidential and will only be used for the analysis of this study. You will not be identified in any way.

1) Are you? _____ Male _____ Female

*2) What is your age? _____ Years

*3) What is your place of residence? _____
                                        (city) (country)

4) What is your nationality? _____

5) What languages do you speak fluently?

_____ Spanish _____ Italian

_____ English _____ German

_____ French _____ Portuguese

_____ Other

*6) What is your highest level of formal education completed. (Please circle one)

a) Primary   e) University

b) Secondary (High School)   f) Graduate, Post-Graduate or Professional

c) Tertiary   School

d) Technical School

7) Are you retired?   _____ Yes _____ No

8) Do you work outside of the home?   _____ Yes _____ No

*9) How many weeks of paid vacation do you receive each year?   _____ weeks

10) How many members are in your household (including yourself)?   _____ people

11) How many of these people contribute to paying household expenses _____ people

*12) Including these people, what was your approximate **annual** household income from all sources (before taxes) last year? (please indicate currency by circling **US$, Argentine Peso, or Euro**)

_____ 5,000 or less	_____ 30,000-39,999	_____ 70,000-89,999
_____ 5,000-9,999	_____ 40,000-49,999	_____ 90,000-109,999
_____ 10,000-19,999	_____ 50,000-59,999	_____ 110,000-139,999
_____ 20,000-29,999	_____ 60,000-69,999	_____ 140,000 or more

Thank you for completing the survey!

If you have further comments about economic development and tourism in the Calafate region, please write them on the back of this page. When you are finished, please hand the survey back to the interviewer. The preliminary results of this study are anticipated in June of 2005. If you would like further information or a copy of the final report, please contact Fundación Naturaleza para el Futuro (FUNAFU),Viamonte 1167 piso 11. Capital Federal (1053) Argentina. Tel/Fax: 5411-4373-5200; E-mail:info@funafu.org (www.naturalezaparaelfuturo.org).

191

APPENDIX IIIC: SCENIC ROADWAY, ARGENTINA VALUATION SCENARIOS

192

Relatively undeveloped

193

Relatively undeveloped plus electric infrastructure

194

Relatively undeveloped plus construction materials (quarry).

Relatively undeveloped plus electric infrastructure and road construction materials (quarry)

APPENDIX IV: ROUTT COUNTY VISITOR SURVEY

STEAMBOAT VISITOR RESEARCH
SUMMER 2005

1. Where are you from? _____
          City   State   Zip Code
   Or Foreign Country _____

2. Please check the primary activities you participated in *during this most recent trip* to the Steamboat area (check all that apply).

   _____ Horseback ride   _____ Visit historic sites   _____ Hike/walk
   _____ Bicycle/Mt. Bike   _____ Picnic   _____ Drive for pleasure
   _____ Fish   _____ Sightsee/photography   _____ Bird watch
   _____ Wildlife viewing   _____ Alpine tundra/flower viewing _____ Camp
   _____ Backpack   _____ Mountain/rock climbing   _____ Hunt
   _____ Ranch visit   _____ River raft   _____ Attend a rodeo
   _____ Golf   _____ Attend other sporting event _____ Attend a concert
   _____ Shop   _____ Other, please describe _____

3. Are there activities that you would like to enjoy in the Steamboat area that *were not* available to you?
        a. YES b. NO If yes, please specify _____

4. Have you ever visited a western ranch? a. YES b. NO

5. About how many *total days* do you expect to visit the Steamboat area during 2005? __ Days.   How many separate trips is that? ____Trips.

198

In your opinion, how much does each of the following NATURAL AND MAN-MADE ASSETS contribute to your enjoyment of a Steamboat vacation? Please rate each attribute or activity using the following scale to indicate *your enjoyment.*

9 8 7 6 5 4 3 2 1

STRONGLY ADDS	NEUTRAL	DETRACTS	STRONGLY DETRACTS

Recreation Amenities

___ Trails to walk, bike, ride horseback
___ Campgrounds, picnic sites, playgrounds
___ Golf courses, tennis courts
___ Hot springs, swimming pools
___ Water recreation sports
___ Access roads, parking
___ Equipment rental, guide services
___ Ball diamonds, ice rinks, rodeo arenas
___ Ski lifts, slopes
___ Other snow sports

___ Fishing opportunities
___ Hunting opportunities

Western Historical Preservation

___ Historical barns, buildings, structures
___ Protection of historical working ranches

___ Protection of traditional ranch family ownership
___ Local museums
___ Local western landmarks, statues, art

Urban Development

___ Restaurants, bars, motels, hotels
___ Other retail businesses
___ Theater, concert hall, dance studio, other cultural amenities
___ Old historic buildings
___ Condos, apartment buildings
___ Houses on small and medium-sized lots
___ Houses on large lots, 15 acres or more

Community Services

___ Medical and dental services
___ Schools, educational services, library
___ Religious organizations
___ Youth programs
___ Government (law enforcement, road maintenance)
___ Jobs (working conditions, pay, benefits)
___ Housing (availability, price, rent, quality)
___ Repair services (auto, house, appliance)
___ Shopping (price, quality, availability)

Natural Environment

___ Climate
___ Air and water quality

___ Rivers, lakes, streams, waterfalls
___ Mountains, forests, wildlife

Ranch Open Space

___ Meadows
___ Birds, wildlife
___ Viewing cattle, horses, sheep

___ Hayland, hay stacks, corrals, ranch buildings
___ Working ranch hands, cowboys

Other Assets
(if any, please identify & rate importance)

_____
_____
_____
_____

6. About how much do you *expect* to spend on your visit to the Steamboat area *on this trip*? And what proportion of those expenditures will be in the Steamboat area?

Amount ($)		Local proportion/percentage (%)
_____	**Transportation**	_____
_____	**Lodging**	_____
_____	**Food and Drink**	_____
_____	**Entertainment**	_____
_____	**Other**	_____
_____	**Total**	_____

199

Did you provide *expenditures* for yourself or as part of a larger group or family?
(Circle one)   Myself   Family/Group
If family or group, how many people are in that group? _____.

7. As you know, the cost of travel (like gasoline, hotels) can increase. If the cost of
   traveling to the Steamboat area went up by _____ would this cause you to visit
   for fewer days during the summer season?
   a. YES b. NO If yes, how many fewer days or fraction of days? _____

8. What if conditions changed? Suppose that you knew that the *existing ranch lands*
   around Steamboat Springs had *changed to urban* uses (housing and other resort
   development). Would this change cause your vacation experience in the Steamboat
   area to be *worth* fewer (or more) dollars per day during the summer season? (circle
   one, and fill in the appropriate blank)
   a. FEWER.   How much less? $_____ Less per day
   b. NO CHANGE
   c. MORE. How much more? $_____ More per day

9. Would this change cause you to visit the Steamboat area fewer (or more) *days* during
   the summer season? (circle one, and fill out the appropriate blank)
   a. FEWER.   How many fewer? _____ Fewer days or fraction of days
   b. NO CHANGE
   c. MORE.   How much more? _____ More days or fraction of days

10. Different people may be interested in the protection of ranch open space for different
    reasons. How about you? *What proportion (percent of 100) of its total annual value
    would you assign to each of the following purposes? Read the entire question first,
    then answer the parts that apply to you; together they should total 100 percent.*

    _____ % The value of your experience *actually viewing* ranch open space (hay
    meadows, pastures, cattle, horses, wildlife, etc.).
    _____ % The value to retain *your opportunity* to view ranch open space in the *future*.
    _____ % The future potential for *upcoming generations* to enjoy viewing ranch open
    space.
    _____ % The value to you from knowing that ranch open space *exists for its own sake,*
    whether or not you, visitors, or future visitors actually see it.
    _____ % The value to you of conserving soil, water, wildlife, and the basis for our
    western cultural heritage due to *the protection of working ranches* on private
    lands.
    _____ % The value to you of *managing growth* to reduce dispersed rural residential
    development due to the continued presence of large acreage working ranches on
    private lands.
    _____ % The value to you from knowing that ranch land is protected as a source of
    private enterprise for ranchers and to *maintain agriculture* as part of the *local
    economy.*
    100% Total

11. About how many miles did you travel from your home to the Steamboat area, and how long did it take you to get here? _____ Miles (one way) _____ Hours (one way)

12. Was the *sole or primary* purpose of your trip leisure travel (not business) to the Steamboat area (no other significant visits along the way)? (circle one) YES NO

13. Have you ever visited *another resort area* with scenery comparable to the existing ranch lands around Steamboat Springs? (circle one)   YES NO

14. About how many miles would you travel from your home to a resort area with scenery comparable to the existing ranch lands around Steamboat Springs? _____ Miles (one way)

15. Are you? (circle one)   Employed Retired Unemployed Work in home

16. Are you (circle one):   Male Female

17. What is your *age*? _____ Years

18. *Education:* (circle highest level completed)

    Jr. High High School 2 yr. College 4 yr. College Graduate or Professional

19. *How many* people in your household were employed outside the home last year? ____ People

20. Approximately what was your household *income* (before taxes) last year? (Check one)

a. Less than $20,000	e. $60,000 - $79,999	i. $170,000 - $209,999
b. $20,000 - $29,999	f. $80,000 - $99,999	j. $210,000 - $259,999
c. $30,000 - $39,999	g. $100,000 - $129,999	k. $260,000 - $299,999
d. $40,000 - $59,999	h. $130,000 - $169,999	l. Over $300,000

Thank you very much for completing this survey.

If there is anything else you would like to tell us about ranch lands around Steamboat, please write it on the space below (or on the back).