PREFERENCES OF TOURISTS AND LOCALS TOWARD ECOTOURISM DEVELOPMENT ON THE STANDING ROCK SIOUX INDIAN RESERVATION

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

MASTER OF SCIENCE

ABSTRACT

Tuscherer, Sheldon Ray, M.S., Program of Natural Resources Management, College of Graduate and Interdisciplinary Studies, North Dakota State University, December 2006. Preferences of Tourists and Locals Toward Ecotourism Development on the Standing Rock Sioux Indian Reservation. Major Professor: Dr. Robert Hearne.

Studies have shown that ecotourism is one of the fastest-growing sectors in the tourism market. To date, there has been very little systematic research focused on the general topic of ecotourism development on Indian reservations. This study researches possible ecotourism alternatives on the Standing Rock Sioux Indian Reservation (SRSIR) in North Dakota. Choice experiments were employed to analyze the preferences of reservation residents and those of cultural tourists. Reservation tourism personnel and local investors will benefit from the information this study provides.

Data for this research were collected through a series of field surveying campaigns. Surveying was conducted on the SRSIR as well as off reservation sites in the surrounding area. All respondents were adults and included a random sample of reservation residents and tourists who demonstrated an interest in cultural and/or nature-based tourism experiences.

Results of this study demonstrate an overwhelmingly positive attitude by all populations toward ecotourism development. Local residents and powwow tourists proved to be insensitive to price, contradicting economic theory. Non-powwow tourists proved to be sensitive to price.

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CHAPTER 1. INTRODUCTION

Research Problem

Nature-based tourism, also known as ecotourism or nature tourism, is defined as "tourism that consists of traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestation found in these areas" (Boo, 1990: 7). Ecotourism can be thought of as tourists who demonstrate stewardship to the culture and stewardship to the land (Figure 1.1). Tourism studies have shown that ecotourism is the fastest-growing demand for international tourists (Lew, 1996). Lew (1996) suggests that Native American tribal governments have not developed their ecotourism markets adequately to capitalize on the demands of this increasing market.

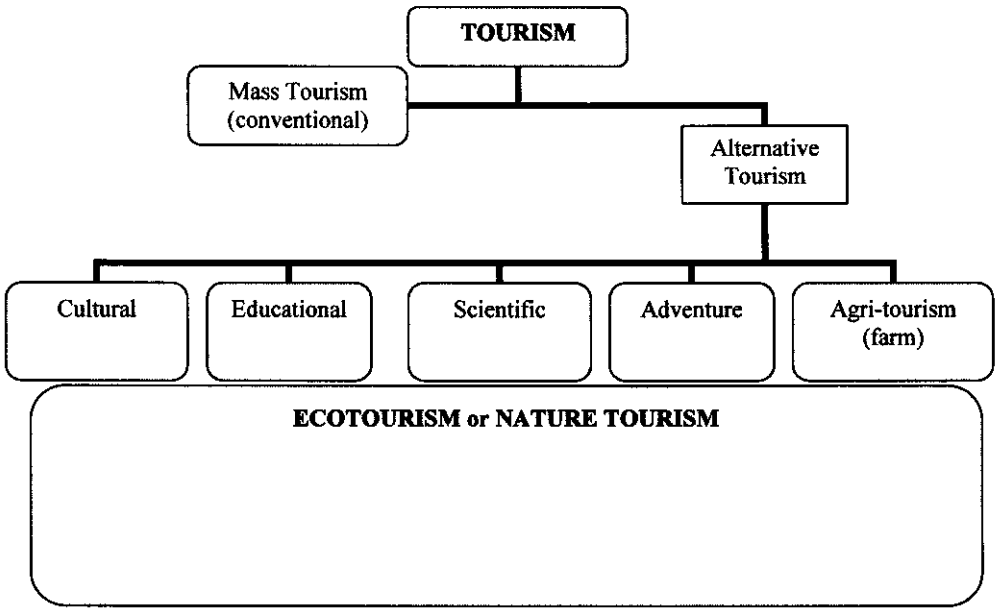


Figure 1.1. Alternative tourism (after Mieczkowski, 1995: 459).

There has been very little research focused on the general topic of ecotourism development on Indian reservations. Available materials dealing with reservation development tend to emphasize industrial, energy, and other natural resources while largely ignoring ecotourism resources (Lew, 1996). Many of the initial reservation studies dealing with tourism potential, including sections in overall economic development plans, were conducted by the U.S. Department of the Interior in the 1960s and early 1970s and, thus, are currently out of date. In addition, these initial studies failed to include ecotourism as a viable tourism potential.

As the diversity and integrity of our nation's native cultures and natural places are increasingly under threat, the world's educated and environmentally aware travelers are seeking ever-increasing contact with them. Ecotourism promises to offer an economic return to these communities for conserving and celebrating their cultures. Ecotourism development will offer indigenous peoples alternatives to destructive industries as well as new employment opportunities while maintaining the natural beauty of their lands and preserving their Native American cultural traditions (Wearing and Neil, 1999).

The Standing Rock Sioux Indian Reservation (SRSIR) of North Dakota/South Dakota, home to the Lakota band of Sioux Indians, encompasses a rich cultural history along with breathtaking natural amenities. Although the reservation offers two casinos, there has been very little ecotourism development on the reservation that would illuminate their cultural history or the reservation's natural amenities. Potential exists for tourism development on the reservation.

The Standing Rock Sioux Indian Reservation straddles the border between North Dakota and South Dakota (Figure 1.2). The reservation is bordered on the east by Lake

Figure 1.2. The Standing Rock Sioux Indian Reservation.

Oahe, a lake created by the Oahe Dam on the Missouri River near Pierre SD. The Cannon Ball River runs along the north side of the reservation and Ceder Creek in the northwest side. The reservation ends at the Perkins County and Adams County line in the west and the Missouri River on its east side. The southern line of the Standing Rock Sioux Indian Reservation ends with the Cheyenne River Reservation line in SD. The total land area of the Standing Rock Sioux Indian Reservation is 2.3 million acres, and of that, 1,408,061 million is tribally owned (The Confederation of American Indians, 1986). The land is primarily occupied by short grass prairie. Buttes, some with elevations of up to 2000 feet, are common throughout the lands (Tiller, 1996). The reservation was established in 1889 in the wake of the Great Plains Wars.

On November 7, 2001, SRSIR Highway 1806 became a North Dakota State Scenic Byway (Standing Rock Tourism, 2005). This same stretch of highway became a national Native American Scenic Byway on September 22, 2005. The Native American Scenic Byway is the gateway to a revealing cultural experience on the SRSIR. It is a journey through the heart of the Teton Sioux Nation. It will allow visitors appropriate access to the history, tradition, development, and future of the Sioux people. The value of the byway is the utilization of existing cultural, historic, recreational, and scenic resources in a well conceived and well planned fashion to foster ecotourism and the resulting economic development. The entire 86 miles of the Standing Rock Native American Scenic Byway are within the borders of the SRSIR and preserves several sites that illuminate the Sioux culture. In addition to its rich history, the reservation is unique due to its location in two states, North Dakota and South Dakota. The Native American Scenic Byway crosses four

Sioux Indian Reservations, linking cultural and recreational sites throughout North and South Dakota.

While much anecdotal evidence exists suggesting that natural resource-based tourism (ecotourism) is growing in North Dakota, with the exception of a periodic assessment of hunting and angling activity, little research has been done on this emerging tourism sector (Hodur *et al.*, 2004). In the absence of research that focuses on ecotourism development, this study is an attempt to capitalize on the scenic byway designation by researching the potential demands for ecotourism alternatives on the SRSIR.

Objectives

The overall objective of this research is to identify viable ecotourism alternatives along with consumer's willingness to pay for these alternatives. By identifying viable ecotourism alternatives in this recently emerging tourism sector, landowners, entrepreneurs, economic development professionals, and policy and decision makers within the SRSIR can use this information to facilitate potential ecotourism development opportunities.

Specific objectives include

1. to identify pertinent ecotourism attributes;
2. to assess preferences for ecotourism attributes using choice experiments;
3. to compare ecotourists' preferences with local residents' preferences;
4. to estimate willingness to pay between both studied populations; and
5. to submit general recommendations to SRSIR personnel based upon research results.

Hypothesis

Based upon literature reviewed, this investigation hypothesizes there will be positive preferences for hypothetical increases in ecotourism opportunities. It is expected there will be differences across populations for these preferences as well as differences in their willingness to pay. In addition, it is expected that willingness to pay for all populations will be positive.

CHAPTER 2. LITERATURE REVIEW

Introduction

The literature review focuses on ecotourism development and the use of choice experiments as a method to identify potential ecotourism attributes and tourists' willingness to pay for these developments. The first section of this literature review centers on empirical studies of reservation developments towards cultural and nature-based tourism. The use of choice experiments for the estimation of non-market values is described in section Two. Section Three briefly explains the contingent valuation method as an alternative to choice experiments. Section Four discusses the use of conjoint analysis as a research technique used to measure the trade-offs people make in choosing between products and service providers. The last section of this literature review presents several studies that have employed the use of choice experiments as part of the research process.

Ecotourism

Beyond its economic importance, tourism development can promote the preservation of cultural and social values, including historical places of interest that might otherwise be lost. This is particularly true for nature tourism because it promotes culturally and ecologically sensitive travel (Luzar *et al.,* 1995).

Given that tourism, like all industries, generates a combination of positive and negative impacts, there remains the difficulty of identifying which tourism projects and development paths make a positive contribution overall to residents' welfare within a community. This difficulty can be overcome by evaluating the tradeoffs that residents are willing to make. Lindberg *et al.* (1999) employed the use of choice experiments to measure these tradeoffs. The authors concluded that surveyed residents understood the survey and

responded in a manner consistent with their preferences. Results indicated that residents were willing to accept the negative impacts of tourism development provided that they also received positive impacts. Those people who enjoy extended vistas of unused space are likely to be attracted to areas such as the Standing Rock Sioux Indian Reservation (SRSIR), whereas those who want a maximum amount of comfort and variety of facilities are more likely to find these in more heavily populated and highly developed areas (BIA, 1973).

Lew (1996) conducted surveys to determine the basic management and resource characteristics of tourism on tribal-owned land in the USA. Surveys were sent to 337 Native American tribal governments. The survey questioned respondents about tribal interest in promoting tourism. The author wanted to know to what degree attributes such as management practices, administrative structures dedicated to tourism, and tourism promotion were being employed by each respondent. Lew concluded that Indian reservation tourism varies greatly from tribe to tribe. He stated that, with the exception of the Hopi reservation and the White Mountain Apache Tribe of the southwest, eastern tribes are more sophisticated when it comes to drawing in tourist. Lew continued to claim that overall, ecotourism development is not as successful as it could be. With cultural tourism being the fastest growing international market in recent years, the author advocated that tribes need to restructure their tourist industry initiatives to capitalize on this trend.

Schneider and Salk (2004) employed onsite questionnaires to understand visitor interest in cultural and nature-based experiences in the Leech Lake Minnesota area. The questionnaires were administered to Leech Lake Minnesota area tourists. The on-site questionnaire was developed in conjunction with the University of Minnesota Tourism Center, the Minnesota American Indian Chamber of Commerce, the Leech Lake Band of

Ojibwe, and Explore Minnesota. The authors concluded that the potential experiences that have the highest percentage of interested respondents are traditional Native American dance performances, tribal gift shops, and Native American cultural heritage history centers.

Browne (1989) conducted a study that explored the status of reservation tourism development in the western United States. Browne explored the evolution and current status of reservation tourism development from two points of view: an overview of development levels described in terms of resources, facilities, and services; and a more subjective dimension based on the expressed opinions of reservation officials who deal with tourism programs. Data were compiled from recently published research on tourism development and from questionnaires mailed to tribal managers or councils throughout the western United States. The study concluded that several tribes experienced job creation and income generation because of tourism development. The economic motive for developing or maintaining a reservation tourism industry remains strong. Reservation peoples active in their own development can be described as encouraged by the results of their current tourism enterprises and optimistic about the future. In many cases, tourism development seems to be related to increased self-esteem, self determination, and positive economic growth (Browne, 1989).

Moscardo and Pearce (1999) conducted a study to identify the demand for experiencing ethnic tourism products. They defined ethnic tourism as traveling for the purpose of observing the cultural expressions and lifestyles of native peoples. Surveys were distributed to more than 1,500 tourists visiting an aboriginal cultural park in Australia. Four distinct groups of visitors were identified based on their levels of interest in

various aspects or features of the ethnic tourism experience. The Ethnic Tourism Connection group is the largest group identified and is very interested in all aspects of indigenous tourism experiences, including learning about different aspects of the visited culture, participating in traditional activities, experiencing traditional food, and seeing arts and crafts. Second, the Passive Cultural Learning group is a group with high levels of interest in ethnic tourism, but more particularly in experiences which focused on cultural learning rather than direct contact experiences. The Ethnic Products and Activities is the third visitor group identified. Its members are characterized by low levels of interest both in learning about ethnic cultures and in direct contact with ethnic people. These respondents are interested in food, crafts, and participation in traditional activities. The final segment is called the Low Ethnic Tourism group reflecting their low levels of interest in ethnic or cultural tourism in general and their low levels of interest in all aspects of indigenous tourism products. These respondents are most likely to be visiting the park as part of a tour or because someone else in their travel party wanted to visit. The study found evidence that ethnic tourists may be balancing a desire for contact with such hosts against a concern over feeling uncomfortable when making choices of their ethnic tourism products.

Choice Experiments

Since some of the attributes of interest in this study do not exist today, it is not possible to rely solely on revealed preference data. Therefore, this study utilizes the choice experiment technique of stated preferences to evaluate tourist's preferences for various ecotourism attributes. The choice experiment (CE) model is a stated preference technique for the estimation of non-market values. The CE model consists of an experimental design that includes all the attributes of research interest and various levels associated with each

particular attribute. It has distinct advantages over other stated preference methods – such as the contingent valuation method – that have been more widely applied (Bennett and Blamey, 2001). Its ability to provide a disaggregated view of values is a key feature. Stated preference data are generated by some systematic and planned design process in which the attributes and their levels are pre-defined without measurement error and varied to create preference or choice alternatives (Louviere *et al.*, 2000). With respondents' preferences broken down into components associated with the attributes that go to make up a good, it is possible to use choice experiment results to investigate the relative importance of attributes and estimate the values associated with various combinations of attribute levels (Adamowicz *et al.*, 1998). Choice experiments differ from typical conjoint methods in that individuals are asked to choose from alternative bundles of attributes instead of ranking or rating them. Thus, choice experiments are consistent with random utility theory and are useful as a method to elicit passive use values.

Proponents of the CE method argue that the approach is capable of overcoming several shortcomings that have been identified with other methods. The main advantages of the CE methodology include its ability to isolate the marginal rate of substitution between attributes of the environmental good, its ability to eliminate or reduce collinearity through control of the design matrix, and a possible reduction in the incentive for respondents to engage in yea-saying (Blamey *et al.*, 1999). Varied in experimental design, choice experiments require respondents to make repeated choices between bundles of attributes.

The technique of choice experiments was found by those developing and applying it to be useful in predicting market shares where a new product or a variation of an established product was being contemplated (Louviere *et al.*, 1983). In choice experiments,

the respondents face a sequence of decisions, where each decision set contains different profiles of the alternatives (Alpizar and Carlsson, 2003). Choice experiments typically are designed to elicit preferences such that as wide an array of possible choice model forms can be estimated from the resulting choice data. Thus, choice experiments are systematically designed to ensure that sets of model parameters can be identified given a maintained hypothesis about the form of the choice model (Adamowicz *et al.,* 1998). The empirical applications of CEs follow directly from random utility theory (RUT) and permit tests of assumptions underlying RUT as well as tests of model forms that are similar to axiomatic conjoint measurement (Bennett and Blamey, 2001).

Choice experiment outcomes enable the probability of an alternative being chosen to be modeled in terms of the attributes used to describe the alternatives (Bennett and Blamey, 2001). Hence, it would be expected that the higher the level of a desirable attribute in an alternative, other factors held constant, the greater the satisfaction or utility associated with that option and the more likely it would be for a respondent to choose it. Conversely, the more of an undesirable attribute in an alternative, the lower the utility and the less likely would be its selection. Such models provide a wealth of information on the willingness of respondents to make trade-offs between the individual attributes and their likely responses to different product circumstances.

A critical component to the choice experiment technique is that of the opt-out option (Johnson *et al.,* 2000). This allows respondents to indicate that they would not choose any of the experimentally designed alternatives presented to them. Depending on how the opt-out option is defined, they would rather choose the status quo, do nothing, or choose their usual option.

Contingent Valuation Method

An alternative to choice experiments is a stated preference technique known as the contingent valuation method (CVM). A CVM application entails a sample of people likely to be affected by a proposed alternative development being asked if they would be willing to pay a specified amount to secure the change (if it is advantageous to them) or to avoid it (if it is disadvantageous) (Bennett and Blamey, 2001). Different sub-samples of respondents are given differing dollar costs. The relationship between the probabilities of a respondent agreeing to pay is then modeled against these differing dollar amounts. Choice experiments are a variant of the CVM.

Boxall *et al.* (1996) presented empirical comparisons of the CVM against that of the choice experiment method. The authors suggested that controversy exists as to the ability of CVM to accurately measure economic value. Focus groups, interviewing hunters, and previous research were all used to determine desirable attributes related with moose hunting in Canada. Values were derived using parallel studies of both CVM as well as the stated preference choice experiment method. The CVM model was estimated using logit methods and the choice experiment model was estimated using conditional logit methods. The authors conclude that the CVM willingness to pay estimate is over 20-times higher than the choice experiment method. The authors believe that the choice experiment method should become more widely used in the valuation of environmental amenities.

Conjoint Analysis

Conjoint Analysis is a research technique used to measure the trade-offs people make in choosing between products and service providers (Green and Srinivasan, 1990). It is also used to predict their choices for future products and services. Conjoint Analysis

assumes that a product can be "broken down" into its component attributes. For example, a car has attributes such as color, price, size, miles-per-gallon, and model style. Using conjoint analysis, the value that individuals place on any product is equivalent to the sum of the utility they derive from all the attributes making up a product. Further, it assumes that the preferences for a product and the likelihood to purchase it are in proportion to the utility an individual gains from the product.

Bennett and Blamey (2001) stated that virtually no circumstances of traditional conjoint analysis used in marketing or environmental studies are consistent with sound economic theory. Thus, traditional conjoint analysis should not be used for environmental valuation purposes. Bennett and Blamey (2001) argued that conjoint analysis methods are based on statistical and mathematical considerations, not behavioral theory. They continued on to say that environmental studies must incorporate sound behavioral theory as part of the research method, not merely statistical techniques. Thus, a key advantage of choice experiments is that they can simulate real behavior as closely as one's resources allow, while being consistent with economic theory. Conjoint analysis studies do not allow for the opt-out option. Bennett and Blamey (2001) posed the question that if respondents cannot indicate that they would not support, vote, pay for, or otherwise prefer any, each, or all options, how does one interpret the outcome of a conjoint analysis?

Choice Experiment Studies

Adamowicz *et al.* (1998) designed a valuation exercise to elicit passive use values relating to caribou preservation using both CVM and CE methods. Their results are encouraging in the sense that the estimated CE models performed very well. In addition, a comparison of the CVM and the CE showed that once error variance is taken into account,

the preferences over income between the two approaches were not significantly different. The CE approach was also shown to have several advantages over CVM. In particular, it allowed them to examine values of attributes, impacts of the choice of functional form on welfare measures, and endowment effects.

Hearne and Santos (2005) made use of choice experiments to analyze tourist's preferences towards the development of ecotourism in the Maya Biosphere Reserve in Peten, Guatemala. The stated preference method was employed to assess the willingness-to-pay for hypothetical products. Because the survey included substitutions as well as tradeoffs, the authors believe that the use of choice experiments had advantages over the contingent valuation method (CVM). Choice experiments were used to evaluate preferences for management, conservation and development strategies for the study area. Seven attributes, four with three levels and three with two levels, were presented in the choice experiment. A multinomial logit model was used to analyze the data. The results indicated that foreign tourists and local residents had similar, but unequal, preferences towards ecotourism development. The authors concluded that the use of choice experiments is suitable in analyzing preferences towards non-market environmental goods and services and ecotourism development.

Hearne and Salinas (2002) used choice experiments as a mechanism to analyze tourist preferences in relation to the development of a volcanic national park in Costa Rica. They surveyed tourists that were visiting an existing volcanic park, considered to be an alternative site to the proposed project. Hearne and Salinas worked in conjunction with park managers in developing the choice sets used on the surveys. Five attributes, three with three levels and two with two levels, were presented in the choice experiment. The data

were then analyzed using conditional multinomial logit models. Results indicated that survey respondents expressed an interest in the development of a volcanic national park. Respondents indicated that there should be a greater effort towards providing more information, better views, and more modern infrastructure. The authors determined that the use of choice experiments is effective in analyzing the preferences of tourists for ecotourism development. They also determined that choice experiments have certain advantages over contingent valuation.

Kelly *et al.* (2006) used a discrete choice experiment (CE) method to examine visitor preferences for land-use, transportation, recreation, and other environmental initiatives intended to promote eco-efficiency in tourism destinations. The authors applied the DCE method in a case study of visitors to Whistler, British Columbia, Canada. The DCE, a stated preference method, collected and analyzed individual preference data to measure variations in choice behavior under varying scenarios or hypothetical situations.

In the DCE section of the survey, respondents were shown three choice sets, each containing a pair of hypothetical mountain resorts. For each pair, respondents were asked to choose their preferred resort on a scale provided. Since the scale did not contain a mid-point (or indifference point), each respondent had to choose one alternative over the other. The scale simply provided an opportunity for respondents to indicate the strength of their preference.

The levels for each attribute provided sufficient variation to matter for tourists and to allow for the simulation of current and potential conditions. The final set of attributes and levels were determined through a process involving a review of academic literature and

stakeholder feedback. The authors also included a payment vehicle, which is a common practice of choice experiments.

The Kelly *et al.* (2006) study used the traditional Multinomial Logit (MNL) model to analyze the data collected from the DCE. The estimated model was used to predict choice behavior in response to changes in attribute levels. By adjusting the attribute levels in the choice model, it was possible to evaluate tourist preferences for various eco-efficient planning strategies.

The authors concluded that by allowing respondents to evaluate and trade-off several attributes simultaneously, the discrete choice survey provided a more comprehensive assessment of visitor preferences than traditional opinion surveys that ask respondents about attributes one at a time. The methodology developed in this research offers destination planners and managers a valuable tool for evaluating tourist preferences for complex and multi-faceted planning issues. It is particularly relevant in tourism situations where proposed policy and planning options can be evaluated before alternatives are implemented. This method provided a useful means of eliciting the perspectives of tourists for decision-making purposes.

Dellaert *et al.* (1995) utilized the conjoint choice experiment approach to modeling urban tourists' choice of activity packages. The proposed approach was implemented and tested in a case study on Dutch urban tourists' choices of activity packages for a weekend in Paris. Respondents were asked to choose from different hypothetical descriptions of activity packages describing a Saturday and Sunday morning in Paris. The approach the authors proposed in this study allowed for the estimation of main effects for multiple activities and of interaction effects between choices on different activities within tourists'

activity packages. It also supported estimates of different utilities for alternatives when introduced at different positions within activity packages.

The joint logit model was introduced to model choices between combinations of activities and an experimental design. It included attributes from multiple alternatives and interactions between attributes of different alternatives. The approach also allowed for tests of possible differences in parameter values for identical attributes when introduced in different periods of the weekend. The authors concluded that the use of a choice experiment approach best exemplified the real decisions tourists are faced with concerning the many activity options available.

Impact on Indians of Euro-American Improvement Strategies

History has shown that the good intentions of many white folks toward Indian improvements have often had devastating consequences. This "do-gooder" mentality must not be overlooked when considering any kind of improvements directed toward the Indian peoples. The Dawes Act of 1887 was quite possibly the most destructive piece of legislation the Indians had thrusted upon them. Recall that this piece of legislation was, in fact, offered as a means to ameliorate Indian suffering. The Dawes Act attempted to create independent Indian farmers by way of giving Indians the land and the tools for citizenship. A common theme among proponents of this act was that now the Indian may become a free man: free from the thralldom of the tribe, free from the domination of the reservation system, and free to enter into the body citizenship. However, to most Indians, this act was negatively viewed as the United States government making a concerted effort to dissolve American Indian tribes by allotting communally held lands and forcing them to adopt Euro-American practices of farming (Deloria and Lytle, 1983).

Between 1879 and 1934, the United States government made a concerted effort to dissolve American Indian tribes by allotting communally held lands and forcing them to adopt Euro-American practices of farming (Deloria and Lytle, 1983). This act mandated that 160 acre plots of land, within the reservation, be allotted to each Indian family. The remaining land within the reservation was considered surplus. The surplus land was now available for purchase by white settlers. This policy greatly reduced the lands held by the Great Sioux Nation.

Underlying this ethnocentric allotment policy was the assumption that Indians wanted to become farmers and had the capacity to do so. Traditional Indian beliefs view land as a sanctuary, not subject to private ownership. In contrast, the white man's industrial view of land was that it was property to be bought, sold, or used for individual gain. What was overlooked by policy makers was the complexity of Indian beliefs and the role these beliefs had on cultural development throughout their long history in North America.

Another destructive piece of legislation the Sioux people had thrusted upon them was the Pick-Sloan Missouri Basin Program, formerly called the Missouri River Basin Project, which was initially authorized by the Flood Control Act of 1944 (Lawson, 1994). This was a comprehensive plan for the conservation, control, and use of water resources in the entire Missouri River Basin. This too was promoted as being beneficial to the Missouri Basin Indians.

Under the Flood Control Act of 1944, the Congress authorized construction of five massive dam projects on the Missouri River as part of the Pick-Sloan program, the primary purpose of which was to provide flood control downstream, as well as improved navigation, hydro-power generation, improved water supplies, and enhanced recreation.

The U.S. Army Corps of Engineers, which constructed and operates the dams, estimates that the projects' overall annual contribution to the national economy averages $1.9 billion. However, for the Indian tribes along the Missouri, the human and economic costs of the projects have far outweighed any benefits received, since the lands affected by Pick-Sloan were, by and large, Indian lands, and entire tribal communities and their economies were virtually destroyed (Lawson, 1994).

CHAPTER 3. METHODOLOGY

Introduction

Tourism research indicates a growing interest in ecotourism experiences. Tourism service industries are exploring viable attributes to be developed in this growing sector. Potential ecotourism developments exist on The Standing Rock Sioux Indian Reservation that could possibly tap into this growing sector. Because many of the alternative tourist experiences that will be considered in this study have not been developed on the reservation, choice experiments for non-market valuation will be used to collect data and a discrete choice multinomial logit model will be used for analysis of these data.

Study Area

The Standing Rock Sioux Indian Reservation (SRSIR) is part of the Great Sioux Nation with the Hunkpapa and Sihasapa (Blackfeet) bands of Lakota (Teton) Sioux Indians. The Great Sioux Nation retains land base in accordance with the Fort Laramie Treaty of 1851 (Tiller, 1996). Signatory representatives for the Sioux nation included Mah-toe-wha-you-whey, Mah-kah-toe-zah-zah, Bel-o-ton-kah-tan-ga, Nah-ka-pah-gi-gi, Mak-toe-sah-bi-chis, and Meh-wha-tah-ni-hans-kah. The Great Sioux Nation once extended from the Big Horn Mountains in the west to the east side of Missouri River. The Heart River was the northern boundary and the Platte River was the southern boundary. The Great Sioux Nation was later reduced in the 1868 Fort Laramie Treaty to the east side of the Missouri River and the state line of South Dakota in the west.

Many of the Standing Rock Sioux Tribal members are descendants of the Lakota (Teton) tribe of the Dakota Nation (Schneider, 1990). The people of the Sioux Nation refer to themselves as Lakota/Dakota which means friend or ally. The Great Sioux Nation is also

called the Lakota Nation, Tetons and the Western Sioux. The Teton band of Sioux Indians (Lakota) moved into the Dakotas from the region just west of the Great Lakes (Tiller, 1996).The original confederation of Lakota was made up of seven nations that spoke three mutually intelligible dialects of the Siouan language. The Standing Rock Sioux Indian Reservation encompasses the bands of Hunkpapa and Sihasapa (Blackfeet) of the Lakota (Teton) tribe (Schneider, 1990). The Lakotas speak an 'L' dialect of Siouan language and were horsemen and buffalo hunters on the plains (Tiller, 1996). Around the middle of the 18th century the Lakota migrated west into what are now the Dakotas in pursuit of buffalo.

The Yankton and Yanktonias are bands belonging to the Middle Sioux (Waciyena) tribes of the Dakota Nation. The Cuthead band belongs to the Upper Yanktonais and the Hunkatina are the Lower Yanktonais. Peoples from both bands can be found on the Standing Rock Sioux Indian Reservation today. The Yanktonais were a river-plains people who did some farming as well as buffalo hunting (Satterlee and Malan, 1972).

The Standing Rock Sioux Indian Reservation operates under a constitution approved on April 24, 1959, by the Tribal Council of Standing Rock Sioux Tribe (Tiller, 1996). The Tribal Council consists of a Chairman, Vice-Chairman, a Secretary and 14 additional Council people who are elected by the tribal members. The reservation is divided into a number of districts which are represented by a popularly-elected 15-member Tribal Council. The Tribal government maintains jurisdiction on all reservation lands, including all rights-of-way, waterways, watercourses and streams running through any part of the reservation and to any others lands that are subsequently added to the reservation under the law of the United States.

Agriculture and livestock have traditionally been the major source of income for the tribe. Ranching and the leasing of grazing permits have been the two primary industries. However, gaming as well as tourism and recreation are increasingly becoming major sources of tribal income (Tiller, 1996).

The tribe's Prairie Knights Casino and the Grand River Casino attract customers from nearby cities and work with tour bus companies in the United States and Canada. The Casinos offer a full-service bar, entertainment shows, lodging facilities, banquet facilities, restaurants, pool, a gift shops, and conference centers. The North Dakota ski resort, Huff Hills, is also located close to the Prairie Knights Casino, bringing in some winter business.

Tourism and recreation are other growing sectors in the tribal economy. With the demand for cultural tourism by foreign tourist being one of the fastest growing industries in tourism, the reservation is making great efforts to tap into this market. Boating, fishing, and waterfowl hunting are quite popular on nearby Lake Oahe. Tribal celebrations include the annual Sioux Indian Fair and the Fourth of July Rodeo. Other attractions include the grave of Sitting Bull and the site of old Fort Manuel.

Multinomial Logit Model

When the discrete dependent variable can take only one of two values, the models are called binary models, and when the discrete variable can take one of more than two values, the models are called multinomial models. A multinomial logit model is used for data in which the response is often a set of choices and is therefore measured on a nominal scale (Greene, 1993). Also, at least some of the independent variables indicate characteristics of the choices (examples are cost, size, and attractiveness) instead of characteristics of the subject or chooser (examples are age and income). The effect of an

independent variable is conditional on the subject's choosing between two alternatives, and it depends on the distance between the variable's values that were assigned by the subject to the two alternatives (Pindyck and Rubinfeld, 1998).

The multinomial logit model is derived from the assumption that the error terms of the utility functions are independent and identically Gumbel distributed (Greene, 1993). These models were first introduced in the context of binary choice models, where the logistic distribution is used to derive the probability. Their generalization to more than two alternatives is referred to as multinomial logit models.

If the error terms are independent and identically Gumbel distributed, with location parameter 0, the probability that a given individual chooses alternative *i* is given by

$$\Pr(y_i = j) = \frac{\exp(X_i \beta_j)}{\sum_j^J \exp(X_i \beta_j)},$$

where y_i is the observed outcome, X is a vector of explanatory variables, β_j is a coefficient, and $y_i = 0$ is the benchmark case. The coefficients are estimated by maximum likelihood.

An important property of the multinomial logit model is the assumption of independence from irrelevant alternatives (IIA). The IIA property states that the ratio of the probabilities of choosing one alternative over another (given that both alternatives have a non-zero probability of choice) is unaffected by the presence or absence of any additional alternatives in the choice set (Louviere *et al.*, 2000). This condition is both a strength and weakness of a choice model. Its strength is that it provides a computationally convenient choice model and permits introduction and/or elimination of alternatives in choice sets without re-estimation. Its weakness is that the observed and unobserved attributes of utility may not be independent of one another, and/or if the unobserved components of utility are

correlated among alternatives, this leads to biased utility parameters and added errors in forecasts. Satisfaction of the IIA condition, however, should not be of general concern because the independence assumption is neither desirable nor undesirable, but should be accepted or rejected on empirical grounds depending on the circumstances (Louviere *et al.*, 2000).

Factorial Design

In choice experiments, individuals are asked to choose from alternative bundles of attributes as presented in the experimental design. Each attribute has a particular level associated with it as well. The experimental design is simply the technique of listing all attributes and assigning one particular level to that attribute. The various levels collectively associated with each attribute represent a choice profile. Respondents are then asked to choose a particular choice profile of their liking. The design of the choice experiment is crucial to the feasibility of the results.

The first step in creating the experimental design is to identify all desirable attributes and the levels associated with each attribute. Once attributes and levels have been selected, they are then configured into choice profiles within the experimental design. The starting point of most choice experiments is the complete factorial design. Factorial designs are designs in which each level of each attribute is combined with every level of all other attributes. Factorial designs can be complete (all possible combinations are used) or fractional (a subset of all possible combinations is used). For a simple choice experiment (few attributes and levels), a complete factorial design may be appropriate. However, for a more complicated choice experiment (several attributes and levels) a complete factorial design may prove to be impractical to implement. Complete factorials grow exponentially

in size and complexity as the number of attributes and levels increase. This complexity may be alleviated by reducing the complete factorial to fractional factorial design. Fractional factorial designs are ways to systematically select subsets of treatment combinations from the complete factorial design such that the effects of primary interest can be estimated under the assumption that interactions are not significant (Bennett and Blamey, 2001). This research utilizes the fractional factorial design method. The complete factorial designs of both the trial and the final survey were reduced manually using SAS PRC OPTEX to produce a D-efficient main effects fractional factorial design.

Four principles of efficient choice designs have been identified by Huber and Zwerina (1996). These principles are orthogonality, level balance, minimal overlap, and utility balance. Orthogonality is satisfied when the levels of each attribute vary independently of one another. Level balance is satisfied when the levels of each attribute appear with equal frequency. Minimal overlap is satisfied when the alternatives within each choice set have non-overlapping attribute levels. Utility balance is satisfied when the utilities of alternatives within choice profiles are the same. These four principles, when jointly satisfied, indicate that a design has minimal D-error.

D-optimality minimizes a measure of the combined uncertainty of the parameters of a linear statistical model and should be used when accuracy of the parameters themselves, rather than the accuracy of the fit, is the primary concern (Louviere *et al.,* 2000). D-optimality is based on the determinant of the information matrix for the design, which is the same as the reciprocal of the determinant of the variance-covariance matrix for the least-squares estimates of the linear parameters of the model. D-optimality is the most

common criterion for computer-generated optimal designs, which is why it is the default criterion for the OPTEX procedure.

Research Design

The initial phase of this research began by securing the necessary Institutional Review Board (IRB) approval. The second phase of this research consisted of a series of meetings between NDSU researchers and SRSIR personnel. These meetings were held in November of 2005 and again in February of 2006. These meetings consisted of personnel from NDSU, the SRSIR Tourism Office, and Sitting Bull College. It was at this time that the proposed research project was outlined to reservation personnel who represent the inner circle of the reservation team. These meetings were successful at securing the necessary tribal approval for research to begin.

The perceived impacts of tourism on host communities, and associated resident attitudes toward tourism, are an important research issue. As demonstrated by the Customs and Norms Document issued by the SRSIR Tourism Office, tourism on the reservation must be approached with the sacredness of the Lakota culture in mind (Customs and Norms Document, Appendix A). For instance, the reservation has many sacred sites that are absolutely off limits to tourism development. Many reservation residents are hesitant to open up their reservation to tourism for fear of their cultural practices being exploited. However, residents are also cognizant of the positive economic impacts that tourism promises to offer. The sacredness of the Lakota culture was always at the forefront while conducting this research.

The process of selecting particular tourist alternatives to be used as attributes in the choice experiment began by conducting an experts meeting. This meeting was held at the

tribal headquarters in Fort Yates, ND. The meeting was conducted in a format consistent with Krueger's (1988) suggestions on focus group meetings. Meeting personnel included representatives from the ND Department of Tourism, the SRSIR Tourism Department, a local entrepreneur, Sitting Bull College, the SRSIR Office of Special Trust, NDSU Department of Agribusiness and Applied Economics, a local archeologist, and a local resident who was familiar with surveying techniques on the reservation. This meeting focused on identifying viable ecotourism attributes that are sought after by tourists and culturally accepted by reservation residents. Recognizing local cultural sacredness was a high priority of this meeting. The expert representatives at this meeting embodied the knowledge of what would be acceptable ecotourism attributes to explore and what would be presumed offensive to the Lakota culture. The experts' meeting was successful at generating a list of possible attributes that could be presented to members of subsequent focus group meetings (Table 3.1).

Focus group meetings were conducted by the lead researcher throughout the months of May and June. Focus group protocol, as established by Krueger (1988), was followed throughout the focus group process. The first focus group meeting was held in Kenel, SD at their annual powwow on May 27, 2006. Powwows are considered to be a social event and open to the public. They provide the opportunity for natives as well as non-natives to get together, sing, dance, renew old friendships and make new ones. Powwows are still very much a part of the lives of many native as well as non-native Americans. Many families, native and non-native, pack up and follow the powwow trail, camping out and enjoying the traditional celebration activities. Powwow participation is open for people of all races. These events have been a part of the Lakota culture for many generations. Powwows

provide the opportunity for residents throughout the reservation to gather together at a central location. For this reason, researchers were hopeful at capturing residents from all eight districts of the reservation.

Table 3.1. Experts' meeting outcome

SUBJECT	COMMENTS
Non-intrusive rural tourism	Birding - nature trails in areas of high probability of seeing rare and endangered species and native plants.
Tribal bison herd	Bison heard tours - hide/bone processing - brain tanning - bison meal - road pullout.
Lewis & Clark trail at marina	Interpretive points - guided hikes - various trail lengths.
Atlatl	Demonstrations on how to build and use and what they were used for.
Learning-based vacations	Construction of tipi - brain tanning - traditional Indian games - traditional agricultural practices - quill demonstration - history of Lakota people and culture - demonstration farm – amphitheater.
Camping	Primitive experiences - possible development: various packages that offer various levels of camping amenities (sleeping quarters, solitude, authentic food, guide, availability of potable water).
Powwow	Social event and opened to everyone.
Prairie dog hunts	Many land owners are actively trying to reduce the numbers of these critters.
Trail development	Nature trails (birding, animal viewing, plant viewing) - bike trails - horse trails - ATV trails.
Scenic byway	Personal guided tours - audio guided tours - interpretive signs along highway.
Areas off limits to tourism development	Levenworth site: the 1st military conflict on the Great Plains - Sitting Bull Camp: the place where Sitting Bull was killed.

Powwows draw in those tourists who are seeking cultural experiences. Researchers agreed that powwow events should provide ample representation of two of the populations

of interest. Powwow participants for this event were primarily native peoples. However, some non-native people also participated in this event as well.

Potential respondents were randomly selected from the crowd and offered refreshments for offering their time and opinions. Respondents consisted of both powwow dancers as well as those folks who were there to view the event. Willing participants were gathered, on the powwow grounds, into small groups of four to six people. They were then prompted for ideas in regards to the list of possible ecotourism attributes that were generated from the experts meeting. The meetings lasted for about a half hour to 45 minutes. Throughout the powwow event, there were several of these meetings successfully held. In addition to group discussions, one-on-one interviews with willing participants were also conducted at the powwow. These discussions also focused on the experts meeting results. Focus group participants consisted of 20 Native Americans of which 14 were SRSIR residents and the remaining six were residents of surrounding reservations. Six ecotourists, who were visiting the reservation for cultural reasons, were also intercepted at this event. All participants were adults.

On May 28, 2006, another round of small focus group meetings was conducted in the Mobridge, SD area. This is a small community located on the eastern bank of the Missouri River, immediately east of the Reservation boundary. This community offers accommodations for tourists with interest in fishing as well as interest in visiting the reservation. Participants were found at area motels. Focus group participants consisted of eight adult non-native nature-based tourists. Again, the focus group discussions centered on the ecotourism suggestions of the experts meeting.

Additional information was gathered throughout the day by visiting several reservation communities. Local residents were approached in their communities and asked if they would be willing to discuss possible ecotourism developments. These encounters consisted of one-on-one meetings as well as meetings with small groups of locals. Twelve adult individuals representing three of the eight districts participated in discussions concerning reservation ecotourism development. Six of the participants participated in a group discussion. The remaining six were one-on-one discussions. Two personnel from the Grand River Casino management also contributed to focus group discussions.

The second round of focus group meetings began at an art symposium held at Sitting Bull College in Fort Yates, ND on June 16, 2006. The same technique previously employed at the Kenel powwow was also employed here. Willing participants were offered refreshments for their participation in focus group discussions. Several small group meetings were conducted throughout the event. Again, the topics of discussion were centered on the ideas generated at the experts meeting. Participants included six art venders, three art buyers, and four local residents who showed up for the event. Two separate focus group meetings were conducted with the above mentioned personnel. Three one-on-one interviews with art symposium participants were also utilized at this event.

Focus group meetings continued on June 17, 2006. These meetings were conducted onsite at Graner Bottom in Sugar Loaf State Park and Fort Rice State Historic Site. These sites are located in ND, just outside of the northern reservation boundary. The Fort Rice State Historic Site meeting consisted of 10 adult participants, five males and five females, and lasted approximately 45 minutes. These participants were camping at the park and primarily interested in the park's fishing and cultural amenities.

The Graner Bottom focus group meeting consisted of six adult participants, three male and three female. This meeting lasted about 45 minutes. Similar to the Fort Rice participants, the Graner Bottom participants were also camping at the park and interested in the park's fishing and cultural amenities. Again, group discussions centered on the results generated at the experts meeting.

Throughout the month of July, results of the focus group meetings were studied and analyzed by personnel from NDSU as well as members of the reservation inner circle. Results indicated there was a strong interest in the following attributes: bison (viewing and processing), trail development (nature and non-nature), demonstration farms, tribal history interpretation, and an amphitheater presentation of Lakota history and culture. Various levels of each attribute were also established based on focus group results (Table 3.2).

Populations of Interest

Researchers identified three populations of interest to this study. Local residents of the Standing Rock Sioux Indian Reservation represented one population of interests. Care was taken to ensure that residents from all eight of the districts were represented in both the focus group discussions as well as instrumentation of the survey. This was accomplished by either visiting a particular district or finding various district members in Fort Yates, ND. Fort Yates represents the fundamental location for several reservation amenities including the Tribal Headquarters building, the Library and Sitting Bull College. It is a common occurrence on any given day to find residents from all eight districts in Fort Yates. The research team's local enumerator was mindful of this throughout the research process. The second population of interest is tourists who are coming to the reservation for the purpose of a cultural or nature experience. There are several locations throughout the reservation

Table 3.2. Trial survey attributes and levels

ATTRIBUTE	LEVELS
Demonstration farm/ranch	1. Culinary farm/ranch tour 2. Culinary farm/ranch tour and hands-on cooking class 3. Culinary farm/ranch tour and cattle round-up 4. No farm/ranch visit
Bison processing	1. Hide tanning class 2. Authentic bison meal 3. Authentic bison meal and hide tanning class 4. No bison processing
Bison herd visit	1. Driving road through herd pasture 2. Stagecoach ride through pasture 3. No herd visit
Trails	1. Nature trail 2. Bike trail 3. ATV trail 4. No trail
Tribal history	1. Interpretive signs along highway 2. Interpretive center 3. Amphitheater show 4. Interpretive center and Amphitheater show
Scenic byway tour	1. Highway pullouts 2. Audio Guide 3. Tour Guide
Price	1. $80.00 2. $120.00 3. $160.00 4. $200.00

where these tourists may be found including area powwows, Fort Manual, The Marina at Prairie Knights Casino, The Bay at Grand River Casino, or special events such as the Chief's Ride or district powwows. Researchers deliberately excluded casino patrons as a population of interest as their tourism characteristics do not fully comply with that of an ecotourists.

The third population of interest is non-reservation ecotourists. These are tourists who are visiting cultural or nature-based attractions outside of the reservation. Locations

such as nearby Fort Abraham Lincoln State Park and Fort Mandan accommodate tourists with these interests. Attributes, levels, and payment options were identical across all three populations.

Trial Survey

Based upon the results of the focus groups, attributes and levels were chosen to be assessed in a trial survey. The preliminary set of attributes and levels allowed for a design with (5^4 x 2^3) possible combinations. The complete factorial design allows for 5,000 possible combinations of attributes and levels. It would be difficult (if not impossible) to ask each respondent in a sample to evaluate and respond to 5,000 combinations. Therefore, this research implemented the concept of a fractional design. The complete factorial design was reduced manually using SAS PROC OPTEX to produce a D-efficient main effects fractional design. The D-efficient main effects optimal design consisted of 288 choice profiles. The 288 choice profiles were arranged into groups of 12. Each choice experiment contained three choice profiles and a "no trip" option. Each respondent was asked to complete four choice experiments. Each respondent was asked to choose a favorable choice profile, among three choice profiles, four separate times. It should be emphasized here that respondents also had the option of choosing none of the choice profiles offered to them. It took twenty-four separate respondents, each completing four choice experiments, to complete the fractional factorial design. Trial surveying was conducted prior to approval of the final survey documents.

Trial surveys were administered in early August. Based on input from the inner circle team, two locations were chosen to administer the trial survey. The annual Fort Yates powwow and rodeo was chosen as the on-reservation site. This event attracts locals from

all eight reservation districts. The Fort Yates powwow and rodeo was also successful at attracting non-resident ecotourists.

Fort Abraham Lincoln State Park, located 30 miles north of the reservation's northern boundary, was the off-reservation site. Fort Abraham Lincoln State Park offers amenities to those tourists who are seeking a cultural experience. This location provided researchers the opportunity to capture the third population of interest, non-reservation ecotourists, in surrounding areas outside of the reservation boundaries.

Two enumerators randomly distributed the survey documents to willing participants at both locations. Upon verification that the willing respondent was among the three populations of interest, the respondent was then asked to complete the survey documents. Sixty-six respondents were approached. Fifty-seven respondents agreed to complete the survey. Respondents were asked to complete the survey in the presence of the enumerator. This allowed the respondent the opportunity, if needed, to ask the enumerator questions in regards to the survey document. Fifty-seven surveys were collected between the two locations. Fifty surveys were deemed usable. The populations captured by the trial survey are as follows: 42 % reservation residents, 32 % reservation ecotourists, and 26 % non-reservation ecotourists. Results of the trial survey were analyzed using a multinomial logit model in the LIMDEP econometric modeling program.

In addition to the survey documents, respondents were also provided a six page information packet (Information Packet, Appendix B) and the IRB consent form (IRB Consent Form, Appendix F). Enumerators sensed that the information packet was too lengthy for most respondents to utilize. Researchers decided to condense this information

onto a one page document for the final survey (Attribute Explanation, Appendix C). This one page document was then included along with the final survey documents.

Final Survey

The trial survey results were subsequently employed to generate the final survey documents. After analysis of the trial survey data, the numbers of attributes assessed were reduced and the final set of attributes and levels were chosen (Table 3.3).

Table 3.3. Final survey attributes and levels

ATTRIBUTE	LEVELS
Demonstration farm/ranch	1. Culinary farm/ranch tour 2. Culinary farm/ranch tour and hands-on cooking class 3. Culinary farm/ranch tour and cattle round-up 4. No farm/ranch visit
Bison processing	1. Hide tanning class 2. Authentic bison meal 3. Authentic bison meal and hide tanning class 4. No bison processing
Bison herd visit	1. Driving road through herd pasture 2. Stagecoach ride through herd pasture 3. No herd visit
Trails	1. Nature trail 2. Bike trail 3. ATV trail 4. No trail
Tribal history	1. Interpretive signs at highway pullouts 2. Interpretive center and amphitheater show 3. No history presentation
Price	1. $80.00 2. $120.00 3. $160.00 4. $200.00

The final set of attributes and levels allowed for a final design with $(4^4 \times 2^3)$ possible combinations. This complete factorial design allows for 2,048 possible combinations of attributes and levels. It would be difficult (if not impossible) to ask each

respondent in a sample to evaluate and respond to 2,048 combinations. The complete factorial design was reduced manually using SAS PROC OPTEX to produce a D-efficient main effects fractional design. This time, the D-efficient main effects optimal design consisted of 432 choice profiles. The 432 choice profiles were arranged into groups of 12. Each choice experiment contained three choice profiles and a "no trip" option. Each respondent was asked to complete four choice experiments. Each respondent was asked to choose a favorable choice profile, among three choice profiles, four separate times. As in the trial survey, respondents also had the option of choosing none of the choice profiles offered to them in the final survey. It took 36 separate respondents, each completing four choice experiments, to complete the fractional factorial design.

Final surveying began at the end of August and ended September 11, 2006. The same protocol for administering the trial survey was employed for the final survey as well. Respondents were randomly selected from the crowd at the various locations listed below. No preference was given to race, creed, or color. The only protocol enumerators adhered to was that they not interrupt anyone who was actively participating in or watching an active event. These people were approached during intermission of events.

Respondents were provided a clip-board containing the IRB consent form (IRB Consent Form, Appendix F), the social and demographic document (Social and Demographic Document, Appendix D), a choice experiment document (Sample Choice Experiment, Appendix E) and a one page document that briefly explained the attributes and levels (Attribute Explanation, Appendix C). Respondents were also offered the opportunity to view a more detailed explanation of the choice experiment if they were still unsure of what was being presented to them (Information Packet, Appendix B).

The following locations were selected for distributing the final survey: Fort Yates, ND (Tribal Headquarters, Public Library, and Sitting Bull College); Wakpala, SD (powwow); Fort Berthold, ND (Lewis and Clark Signature Event and Powwow); Mobridge, SD; Fort Mandan, ND; Knife River Indian Village, ND; Fort Abraham Lincoln State Park, ND; and Bismarck, ND (United Tribes Powwow). Table 3.4 presents the distributions of the sample across various sites.

Table 3.4. Location of survey application

LOCATION	**SURVEYS COMPLETED**	**POPULATION**
Fort Yates, ND	28	Local residents (all eight districts represented)
Wakpala, SD Powwow	13	Local residents (8) Reservation tourists (5)
Fort Berthold, ND Powwow	20	Non-Reservation ecotourists
Mobridge, SD	6	Local residents (5) Reservation tourists (1)
Grand River Casino Resort, SD	6	Local residents (4) Reservation tourists (2)
Fort Mandan, ND	25	Non-Reservation ecotourists
Knife River Indian Village, ND	6	Non-Reservation ecotourists
Fort Abraham Lincoln, ND	11	Non-Reservation ecotourists
Bismark, ND	16	Local residents (7) Non-Reservation ecotourists (9)
United Tribes Powwow Bismarck, ND	52	Local residents (15) Non-Reservation ecotourists (37)

Two-hundred five potential respondents were asked to complete the survey. There were 183 willing respondents. Twenty-one surveys were rejected by the lead enumerator on grounds that the respondents did not match a population of interest for this research.

Twenty surveys were rejected based on LIMDEP modeling results. Models that included these 20 surveys produced irrational results. Consequently, researches decided to eliminate them. One-hundred forty-two surveys were deemed usable. Surveying was successful at capturing a complete block of 36 choice experiments from both reservation residents and non-reservation ecotourists. The populations captured by the final survey are as follows: 38% reservation residents and 62% non-reservation ecotourists.

Unlike the trial survey, reservation ecotourists proved to be problematic to capture for the final survey. Researchers anticipated the Wakpala Powwow would draw in more reservation ecotourists than what proved to be the case. Additional reservation sites such as Fort Manual, The Marina at Prairie Knights Casino, and The Bay at Grand River Casino were also considered as possible sites to capture reservation ecotourists. However, no ecotourists were found at any of these alternative locations during the final survey period.

Results of the final survey were analyzed using a multinomial logit model in the LIMDEP version 3.0 econometric modeling program. Initial analysis indicated problematic results in regards to the local enumerator surveying tourists. Analytical results of these surveys proved to be inconsistent with results of tourist models that excluded these data. Results using these data indicated price to be insignificant. However, when these questionable data were removed, price proved to be significant for tourists. One possible explanation for this outcome may have to do with the local enumerator being Native American. It seems plausible that respondents may have responded in a more generous manner to price when in the presence of a Native American.

CHAPTER 4. RESULTS AND DISCUSSION

Introduction

This chapter presents the empirical results of the research. Demographic information about participants and a summary of their attitudes in regards to various ecotourism issues are included. Several multinomial regression models are also presented and explained.

Respondent Attitudes

Participants were asked what their main tourism interest was and provided a list of options to choose from. Approximately 49% (Table 4.1) of participants indicated their main tourism interest was that of experiencing a cultural, historical, or educational vacation.

Table 4.1. Participants' tourism interest

Option	Number	Percentage
Family	34	23.9
Hunting and Fishing	11	7.7
Cultural, Historical, Educational	69	48.6
Nature Based (non-hunting & fishing)	15	10.6
Amusement Parks	4	2.8
Gaming	7	5.0
Other	2	1.4

Having been explained the concept of ecotourism and briefed on the few existing possibilities, participants were then asked if they felt there should be greater ecotourism development on the SRSIR. Nearly 84% of participants agreed there should be a greater development of ecotourism on the SRSIR (Table 4.2). Eight-six percent of SRSIR residents agreed there should be a greater development of ecotourism on the reservation (Table 4.3). Respondent's place of residence is shown in Table 4.4.

Table 4.2. Ecotourism development on the reservation

Option	Number	Percentage
Agree	119	83.8
Indifferent	13	9.1
Disagree	3	2.1
Don't Know	7	5.0

Table 4.3. SRSIR residents' view on ecotourism

Option	Number	Percentage
Agree	37	86.0
Indifferent	2	4.7
Disagree	0	0
Don't Know	4	9.3

Table 4.4. Respondents' location of residence

Option	Number	Percentage
SRSIR	43	30.3
ND	40	28.3
SD	5	3.5
MN	8	5.6
Other US	32	22.5
Europe	1	0.7
Other country	4	2.8
Other tribe	9	6.3

As explained in the Methodology chapter, the choice experiment document allowed respondents to choose from options A, B, C, or D. Options A, B, and C all represent various ecotourism trip packages. Option D allows respondents to indicate that they are not interested in any sort of ecotourism trip. Table 4.5 indicates over 80% of respondents preferred some kind of ecotourism trip option to that of no trip.

Table 4.5. Frequency of respondent choosing trip

Choice	Percentage
Trip	80.3
No trip	19.7

Multinomial Logit Models

This research was designed under the assumption that there are three distinct populations of interest in regards to ecotourism development on the reservation. Again, these three populations are SRSIR residents, reservation tourists, and non-reservation tourists. Survey documents were identical for all populations. As mentioned in the previous chapter, reservation tourists proved hard to find. Because of this difficulty, researchers decided upon two populations of interest: residents and tourists. The small number of reservation tourists who were surveyed has been included in the overall grouping of tourists. A test of the equality of the multinomial logit models between that of residents and tourists was conducted under procedures outlined by Swait and Louviere (1993). The equality of the combined coefficients and scale parameters was not rejected with a likelihood ratio test of the form

$$-2[\text{loglikelihood (pooled data)} - \text{loglike (residents)} - \text{loglike (tourists)} = 16.058 \sim X^2_{14}$$

using 14 degrees of freedom for the restricted parameters and the varying scale parameter, μ. Given that the critical value for the X^2_{14} distribution at the 95% confidence level is 23.68, the equality of the combined coefficients and scale parameters between the two populations was not rejected. This test demonstrates that the two populations, residents and tourists, do not have completely different preference orderings. Maximum likelihood estimates of the all respondents' multinomial logit model are presented in Table 4.6, the

resident respondents' multinomial logit model in Table 4.7, and the tourist respondents' multinomial logit model in Table 4.8. It should be mentioned here that "n" represents the number of observations. Recall that each respondent was asked to complete four choice experiments.

Table 4.6. All respondents' model (n=568)

Variable	Coefficient	Standard error	b/Std. error	P[|Z| > z}]
Culinary tour	0.4289	0.1682	2.549	0.0108
Culinary class	0.5347	0.1620	3.299	0.0010
Cattle roundup	0.4701	0.1686	2.788	0.0053
Hide tanning	0.4665	0.1692	2.756	0.0059
Bison meal	0.7412	0.1657	4.473	0.0000
Meal/tanning class	0.8415	0.1668	5.043	0.0000
Road	0.5296	0.1466	3.613	0.0003
Stagecoach ride	0.6254	0.1431	4.368	0.0000
Nature trail	0.7837	0.1638	4.783	0.0000
Bike trail	0.6148	0.1685	3.649	0.0003
ATV trail	0.2038	0.1701	1.198	0.2309
Highway signs	0.4756	0.1481	3.210	0.0013
Center/amphitheater	0.9121	0.1446	6.308	0.0000
Price	-0.0676	0.0488	-1.385	0.1659

When interpreting statistical results in a choice experiment, the value of the coefficient is of little direct meaning. The sign and the statistical significance of the coefficient are of primary importance. The sign of the coefficient indicates whether there is a positive or negative preference for the attribute of interest. Indeed, the coefficients in all these models are of the expected sign.

The significance of the coefficients varies from model to model. Consistent in all three models is the lack of interest in an ATV trail. This attribute seemed to be of particular interest during pre-survey meetings with the local population. Focus group results however did give an indication that this attribute might be an interest to local residents only.

Table 4.7. Resident respondents' model (n=216)

Variable	Coefficient	Standard error	b/Std. error	P[|Z| > z}]
Culinary tour	0.2136	0.2682	0.796	0.4258
Culinary class	0.1626	0.2560	0.635	0.5254
Cattle roundup	0.2373	0.2594	0.915	0.3602
Hide tanning	0.6040	0.2835	2.131	0.0331
Bison meal	0.9568	0.2743	3.488	0.0005
Meal/tanning class	1.0752	0.2705	3.975	0.0001
Road	0.2176	0.2346	0.927	0.3537
Stagecoach ride	0.4295	0.2242	1.916	0.0554
Nature trail	0.6917	0.2642	2.618	0.0088
Bike trail	0.5282	0.2727	1.937	0.0527
ATV trail	0.2983	0.2706	1.103	0.2702
Highway signs	0.2364	0.2306	1.025	0.3054
Center/amphitheater	0.6201	0.2188	2.834	0.0046
Price	-0.0200	0.0782	-0.256	.7983

Table 4.8. Tourist respondents' model (n=352)

Variable	Coefficient	Standard error	b/Std. error	P[|Z| > z}]
Culinary tour	0.5724	0.2208	2.592	0.0096
Culinary class	0.7766	0.2145	3.619	0.0003
Cattle roundup	0.6291	0.2257	2.787	0.0053
Hide tanning	0.3746	0.2138	1.752	0.0798
Bison meal	0.6393	0.2122	3.012	0.0026
Meal/tanning class	0.7381	0.2158	3.420	0.0006
Road	0.7365	0.1921	3.833	0.0001
Stagecoach ride	0.7705	0.1894	4.067	0.0000
Nature trail	0.8526	0.2125	4.012	0.0001
Bike trail	0.7004	0.2176	3.218	0.0013
ATV trail	0.1711	0.2223	0.770	0.4413
Highway signs	0.6558	0.1964	3.339	0.0008
Center/amphitheater	1.1449	0.1959	5.842	0.0000
Price	-0.1082	0.0637	-1.699	0.0892

Although the price coefficient is negative in all models, it reaches a 0.10 level of significance only in the tourists' model. A possible explanation of this result could be that residents may be viewing tourists' expenditures as income coming into the reservation.

Residents could possibly perceive that listed prices are not what they themselves would be paying but rather the price that only tourists would be expected to pay for a tour package.

Results indicate that residents are indifferent towards all of the levels of a culinary farm tour. They do have positive preferences toward bison processing presentations. Residents do not significantly prefer a road through their bison pasture over a "no visit to the bison pasture" option. But they do favor a stagecoach tour through the pasture. They might perceive the stagecoach tour as environmentally friendly and labor intensive. And residents are also in favor of a nature trail and an amphitheater show. As shown in Table 4.3, 86% of resident respondents agree there should be greater ecotourism development on the reservation.

With the exception of the ATV trail, the tourists' model reaches a 0.10 level of significance for the remaining variables. Indeed, these results confirm to the lead enumerator's perception that tourists did in fact pay particular attention to each tour package being offered, including the price for each package. This same perception was not realized by the lead enumerator for the local population. Reaching the 99% level of significance in the tourists' model are the stagecoach ride and the interpretive center with an amphitheater. The significance of the amphitheater should be of particular importance to reservation tourism developers. The idea of developing an amphitheater is currently being researched by reservation personnel. This ecotourism study clearly shows an interest by tourist in an amphitheater show.

Various multinomial logit models were subsequently tested using a multitude of various parameters. Researchers hypothesized that, while rejecting the local population, separate populations also existed between powwow tourists and non-powwow tourists. As

indicated in the methodology section of this report, there were three powwow locations where respondents were surveyed. A test of the equality of the multinomial logit models between that of powwow tourists and non-powwow tourists was conducted under the same procedures outlined above. The equality of the combined coefficients and scale parameters was not rejected with a likelihood ratio test of the form

$$-2[\text{loglikelihood (all tourists)} - \text{loglike (non-powwow)} - \text{loglike (powwow)}] = 22.761 \sim X^2_{14}$$

using 14 degrees of freedom for the restricted parameters and the varying scale parameter, μ. Given that the critical value for the X^2_{14} distribution at the 95% confidence level is 23.68, the equality of the combined coefficients and scale parameters between the two populations was not rejected. Again, this test demonstrates that the two populations, non-powwow tourists and powwow tourists, do not represent completely different preference orderings. Maximum likelihood estimates of the non-powwow tourists are shown in Table 4.9 and for powwow tourists in Table 4.10.

Results for the powwow tourists indicate that price in not only insignificant, but also of the wrong sign. The fact that the price coefficient is positive contradicts economic theory that suggests that all things being equal, an individual would prefer to pay less to more and would prefer to pay zero than to have a positive payment. Further tests for powwow tourists were run in which various parameters were explored. The model was somewhat improved, however, price was still not significant.

Powwow participants may be expressing their overall beliefs about the positive impact reservations may experience through ecotourism development regardless of the cost to participants. This presumption may well be in line with the Moscardo and Pearce (1999) study. This study labeled one of the four distinct groups of ethnic tourists as "The Ethnic

Table 4.9. Non-powwow tourists' model (n=136)

Variable	Coefficient	Standard error	b/Std. error	P[|Z| > z}]
Culinary tour	0.6596	0.3714	1.776	0.0757
Culinary class	0.8416	0.3524	2.388	0.0169
Cattle roundup	0.6426	0.3778	1.701	0.0889
Hide tanning	0.1104	0.3641	0.303	0.7617
Bison meal	0.7196	0.3431	2.097	0.0360
Meal/tanning class	0.6848	0.3552	1.928	0.0539
Road	1.0570	0.3201	3.302	0.0010
Stagecoach ride	0.7460	0.3261	2.288	0.0222
Nature trail	0.8330	0.3452	2.413	0.0158
Bike trail	0.5123	0.3541	1.447	0.1480
ATV trail	-0.2636	0.3723	-0.708	0.4789
Highway signs	0.1279	0.3174	0.403	0.6869
Center/amphitheater	0.7485	0.3082	2.429	0.0151
Price	-0.3263	0.1101	-2.964	0.0030

Table 4.10. Powwow tourists' model (n=216)

Variable	Coefficient	Standard error	b/Std. error	P[|Z| > z}]
Culinary tour	0.5603	0.2821	1.986	0.0470
Culinary class	0.7632	0.2769	2.757	0.0058
Cattle roundup	0.6326	0.2893	2.187	0.0287
Hide tanning	0.5630	0.2734	2.059	0.0395
Bison meal	0.6491	0.2782	2.333	0.0196
Meal/tanning class	0.8193	0.2809	2.917	0.0035
Road	0.5941	0.2471	2.405	0.0162
Stagecoach ride	0.8242	0.2403	3.430	0.0006
Nature trail	0.9390	0.2784	3.372	0.0007
Bike trail	0.8445	0.2834	2.980	0.0029
ATV trail	0.4213	0.2899	1.453	0.1461
Highway signs	0.9971	0.2608	3.823	0.0001
Center/amphitheater	1.4262	0.2628	5.428	0.0000
Price	0.0087	0.0817	0.106	0.9153

Tourism Connection Group." Recall, that, this group is interested in all aspects of the indigenous tourism experience. Perhaps this interest is so strong that price becomes less of a concern.

The remaining coefficients in the powwow model are all positive. With the exception of the ATV trail, all reach a 0.10 level of significance. The positive signs on the coefficients indicate that, all things being equal, powwow respondents prefer the offered level of ecotourism development to that of no development.

Results for the non-powwow tourists indicate that price is negative and reaches the 0.01 level of significances. This supports the researcher's assumptions that tourists are sensitive to price and the value associated with a particular price. With the exception of hide tanning, bike trail, ATV trail, and highway sings, the remaining coefficients all reach the 0.10 level of significance. Results indicate the center and amphitheater variable reaches the 0.01 level of significance. Indeed, this high level of significances is consistent throughout all the models. All populations of respondents seem to be particularly interested in an interpretive center with an amphitheater show. Results for the non-powwow model indicate a negative coefficient for the ATV variable. This may simply be interpreted that, all things being equal, non-powwow tourists absolutely do not prefer an ATV trail.

Consistent in all the models is the lack of significance in the interest of offering an ATV trail. This attribute seemed to be of particular interest to the local population during pre-survey meetings. Subsequent multinomial logit models using only local respondent data were run to further test for the significance of the ATV variable. These models also confirmed the insignificance of the ATV variable.

With price being insignificant to local respondents and the overall significance of price in the non-powwow tourists' model, researchers believe the non-powwow tourists' model to be the superior model. Consequently, this model will be used to study willingness

to pay and also a variety of respondent's social and demographic characteristics in the following section.

Marginal Values

As is the case in most choice experiments, one of the main objectives is that of estimating the marginal willingness to pay (MWTP) from respondents. Marginal willingness to pay may be obtained by calculating the marginal values. Marginal values can be calculated from the marginal rate of substitution between a coefficient, β_i and the coefficient for the price parameter, γ, so that marginal willingness to pay for an increase in an attribute is calculated as

$$MWTP_i = - \beta_i / \gamma$$

with the absolute value of γ representing the marginal utility of income (Alpizar *et al.*, 2001).

The positive price coefficient in the powwow model negates the possibility of estimating MWTP from the results of the multinomial logit model. The insignificance of price in the resident's model also negates the possibility of estimating MWTP for the local residents. Therefore, the non-powwow model will model will be utilized for MWTP calculations. Marginal willingness to pay for attributes reaching a 0.10 level of significance for non-powwow respondents are presented in Table 4.11. The reader will notice that the values in Table 4.11 do not correspond with the values from the previous non-powwow model. For instance, the variable coefficients divided by the price coefficient in the previous model do not represent what is reported in Table 4.11. This is the result of the author introducing actual dollar amounts in the MWTP model. The previous non-powwow model used the values of one, two, three, and four to represent the price variable.

Table 4.11. Non-powwow tourists' marginal willingness to pay

Variable	MWTP	Standard error	P[|Z| > z}]
Bison meal	$0.84	0.3410	0.0127
Meal/tanning class	$218.75	103.6471	0.0348
Road	$166.55	87.8657	0.0580
Stagecoach ride	$140.38	77.6895	0.0708
Nature trail	$182.64	95.1382	0.0549
Bike trail	$147.92	86.6569	0.0878
Center/amphitheater	$174.48	88.5459	0.0488

Although this method is valid in the general multinomial logit model, this form of representation is not accurate when estimating the MWTP.

With the exception of the bison meal, the results indicate a relatively high MWTP for individual attributes. Although the variables reach a 0.10 level of significance, the standard errors remain high. This may be attributed, in part, to the relatively low number of respondents.

In order to test for the impact of the respondents' socioeconomic characteristics on their preferences, mixed multinomial logit models were employed. These models presume that the probability of selecting a particular alternative is not only a function of the attributes associated with the alternative, but also a function of the attributes associated with the respondent. Non-powwow tourists' social and demographic data, including income, education, and the number of vacation days per year, were introduced as interaction terms in individual models. It seems reasonable to presume that collinearity exists among these variables. For instance, one would presume that, as education increases, so, too, does income. For this reason, these variables were introduced separately into the three models. However, none of these terms reached the 0.10 level of significance. Results of the price*income interaction are presented in Table 4.12. Researchers had hypothesized

that, as a respondent's income, education, or the number of vacation days increased, so, too, would the willingness to pay. This hypothesis was, in fact, contradicted by the model results.

Table 4.12. Non-powwow tourists' interaction terms

Variable	Coefficient	Standard error	b/Std. error	P[|Z| > z}]
Price * Income	-0.0737	0.0490	-1.502	0.1332
Culinary tour	0.6491	0.3720	1.745	0.0810
Culinary class	0.8591	0.3531	2.433	0.0150
Cattle roundup	0.6419	0.3803	1.688	0.0914
Hide tanning	0.0892	0.3642	0.245	0.8065
Bison meal	0.7134	0.3439	2.074	0.0381
Meal/tanning class	0.6615	0.3558	1.859	0.0631
Road	1.0540	0.3210	3.283	0.0010
Stagecoach ride	0.7416	0.3260	2.275	0.0229
Nature trail	0.8400	0.3465	2.424	0.0153
Bike trail	0.5047	0.3560	1.418	0.1563
ATV trail	-0.2537	0.3725	-0.681	0.4958
Highway signs	0.1502	0.3187	0.471	0.6374
Center/amphitheater	0.7688	0.3110	2.472	0.0135
Price	-0.1179	0.1779	-0.663	0.5076

CHAPTER 5. SUMMARY AND CONCLUSIONS

Introduction

Chapter Five provides a brief summary of this thesis, including short discussions of the procedures used and results of the multinomial logit analysis. Key conclusions are also presented as are limitations of the research and suggestions for future research.

Summary of Thesis

Data for this research were collected through a series of field surveying campaigns. Surveying was conducted on the SRSIR as well as off reservation sites in the surrounding area. All respondents were adults and included a random sample of reservation residents and tourists who demonstrated an interest in cultural and/or nature based tourism experiences. Respondents were presented with various tourism packages offering various attributes and levels and asked to choose a package of their preference. The option of choosing none of the packages was also provided to each respondent.

Several multinomial logit models were used in evaluating attribute significance amongst several populations. Contrary to what researchers hypothesized, log likelihood results indicated separate populations do not exist. The impact of price across populations was unexpected and inconsistent with researchers' hypotheses as well. Results indicated that price is insignificant to locals as well as powwow tourists, while non-powwow tourists exhibited sensitivity to price. A possible explanation to local's attitude toward price may be that they are of the impression that price is a reflection of income that will be entering the reservation. This income would in turn benefit the local residents. With the exception of the earlier presumptions in regards to the Moscardo and Pearce (1999) study, researchers are

unable to postulate why price would be insignificant to powwow tourists. Further research is necessary to determine the reasons for this.

With the exception of the ATV trail in the non-powwow model, this analysis demonstrates that positive preferences toward ecotourism opportunities exist across all attributes. This finding conforms to the researchers' hypothesis. Indeed, nearly 84% of respondents indicated an interest in greater ecotourism opportunities on the reservation. Again, these results are in line with Lew's (1996) study which indicated that ecotourism on Indian Reservations is underdeveloped.

The significance of ecotourism attributes varied across all models with the tourists' model exhibiting the most significance toward attribute opportunities. Again, with the exception of the ATV trail the remaining attributes all reached the 0.10 level of significance. It therefore seems reasonable to presume that these attributes either singular or collectively, are in fact applicable for future development.

Perhaps the most interesting result of the multinomial logit models is the respondents' stated preference toward an interpretive center and an amphitheater show. Respondents' interest in an interpretive center with an amphitheater show maintained a 0.01 level of significance throughout all models. This fact should be greeted with enthusiasm by reservation tourism developers and decision makers who are currently considering developing this opportunity.

The use of choice experiments did prove to be an appropriate tool to analyze preferences toward ecotourism development. Consistent with the Kelly *et al.* (2006) study, choice experiments allowed respondents to evaluate and trade-off several attributes

simultaneously. This provided a more comprehensive assessment of visitor preferences than traditional opinion surveys that ask respondents about attributes one at a time.

Recommendations to the SRSIR

Results of this study demonstrate an overwhelmingly positive attitude by all populations toward ecotourism development. With the scenic byway providing tourists an incentive to enter the reservation, the development of ecotourism alternatives should become a priority for the Tribal Tourism Office as well as local investors in an attempt to entice tourists to exit the highway and spend time on the reservation. With the exception of an ATV trail, development of the remaining alternatives is sought after by ecotourists. The overall highest tourists' preference is toward an interpretive center with an amphitheater show. This result is consistent with the Schneider and Salk (2004) study that indicated Native American cultural heritage history centers as being among the top three interests of respondents in their study.

This research should assure reservation tourism personnel that the local population overwhelmingly supports the development of ecotourism alternatives on the reservation. Indeed, this overwhelming support concurs with the Lindberg *et al.* (1999) study which indicated that residents are willing to accept the negative impacts of tourism development provided that they also receive positive impacts.

There was, throughout the surveying process, the occasional comment from a local indicating they heard of someone who was either thinking of or in the process of developing ecotourism alternatives similar to those being proposed in this study. With this in mind, future development should investigate more thoroughly that which already exists in regards to ecotourism opportunities on the reservation and develop accordingly.

As Wearing and Neil (1999) alluded to in their study, the SRSIR tourism personnel should view ecotourism development as offering alternatives to destructive industries as well as offering new employment opportunities while maintaining the natural beauty of their lands and preserving their Native American cultural traditions.

Limitations and Future Research

The experimental design along with the supplemental questionnaire employed in this research may have been too lengthy and hence perhaps too complicated. Indeed, some respondents commented negatively in this regard. Given that surveying was employed at tourist attractions, respondents may have felt discomfort at being interrupted while attempting to enjoy their surroundings. This discomfort may have in turn had a negative impact on respondents toward completing the survey in total earnestness.

Although the population of participants was relatively heterogeneous, the numbers captured were somewhat low. Budgetary constraints on time mandated a shorter than preferred time frame to conduct the surveying. This in turn resulted in fewer respondents than what researchers would have liked to capture. Caution is thus advised in applying the results to a wider population (e.g., consumers in general, consumers over a larger geographic range).

Although the willingness to pay model was constructed under the directions outlined by Greene (2002), potential ecotourism developers should view these results with prudence. With price being insignificant in some of the models, respondent's willingness to pay should be further studied. Local residents' attitude toward price demands further research as well. Researchers' presumptions warrant further investigation as to why locals are not price sensitive.

This research did not address the costs associated with ecotourism development on the reservation. It is recommended that a thorough cost/benefit analysis be performed before any such development is undertaken.

Any implementation of reservation development must carefully consider the ramifications of doing so. History has shown that often times well intended ideas have in fact had very negative consequences to Indigenous peoples. Indeed, the Dawes Act of 1887 and the Pick Sloan Act of 1944 are testament to the destructiveness of well intended ideas. This "do-gooder" approach toward Indian improvements must not be overlooked. Ecotourism development on the Standing Rock Sioux Indian Reservation must be cognizant of not compromising the sacredness of the Lakota culture.

LITERATURE CITED

Adamowicz, W., Boxall, P., Williams, M., and Louviere, J. (1998). Stated Preference Approaches for Measuring Passive Use Values: Choice Experiments and Contingent Valuation. *American Journal of Agricultural Economics* 80, 64-75.

Adamowicz, W., Louviere, J., and Williams, M. (1994). Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities. *Journal of Environmental Economics and Management* 26, 271-292.

Alpizar, F. and Carlsson, F. (2003). Policy Implications and Analysis of the Determinants of Travel Mode Choice: An Application of Choice Experiments to Metropolitan Costa Rica. *Environment and Development Economics* 8, 603-619.

Alpizar, F., Carlsson, F., and Martinson, P. (2001). Using Choice Experiments to Value the Environment. Working Paper in Economics, 52. Department of Economics, Goterborg University, Goterborg, Sweden.

Bennett, J. and Blamey, R. (2001). *The Choice Modelling Approach to Environmental Valuation.* Edward Elgar Publishing, Inc., Northampton, MA.

Blamey, R.G. and Chapman, R. (1999). Choice modeling: Assessing the Environmental Values of Water Supply Options. *Australian Journal of Agricultural and Resource Economics* 43, 337-357.

Boo, E. (1990). *Ecotourism: The Potentials and Pitfalls.* Vol. 1. World Wildlife Fund, Washington, D.C.

Boxall, P., Adamowicz, W., Swait, J., Williams, M., and Louviere, J. (1996). A Comparison of Stated Preference Methods for Environmental Valuation. *Ecological Economics* 18, 243-253.

Browne, R.J. (1989). Western Indian Reservation Tourism Development. *Annals of Tourism Research* 16, 360-376.

Carson, R. T., Flores, N. E., Martin K. M., and Wright, J. L. (1996). Contingent Valuation and Revealed Preference Methodologies: Comparing the Estimates for Quasi-Public Goods. *Land Economics* 72 (1), 80-99.

The Confederation of American Indians (1986). *Indian Reservations; A State and Federal Handbook.* McFarland and Company, Inc., New York, NY.

Dellaert, B., Borgers, A., and Timmermans, H. (1995). A Day in the City: Using Conjoint Choice Experiments to Model Urban Tourists' Choice of Activity Packages. *Tourism Management* 16 (5), 347-353.

Deloria, V. Jr. and Lytle, C. M. (1983). *American Indians, American Justice.* University of Texas Press, Austin, TX.

Green, P. E. and Srinivasan, B. (1990). Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice. *Journal of Marketing* 54 (4), 3-19.

Greene, W. H. (1993). *Econometric Analysis.* 2nd Edition. Macmillan Publishing Company, New York, NY.

Greene, W. H. (2002). *NLOGIT Version 3.0 Reference Guide.* Econometric Software, Sydney, Australia.

Hearne, R. and Salinas, Z. (2002). The Use of Choice Experiments in the Analysis of Tourist Preferences for Ecotourism Development in Costa Rica. *Journal of Environmental Management* 00, 1-11.

Hearne, R. and Santos, A. C. (2005). Tourists' and Locals' Preferences Toward Ecotourism Development in the Maya Biosphere Reserve, Guatemala. *Environment, Development, and Sustainability* 7 (3), 305-318.

Hodur, N., Bangsund, D. A., and Leistritz, F. L. (2004). "Characteristics of Nature-Based Tourism Enterprises in North Dakota." Agribusiness and Applied Economics, 537. Department of Agribusiness and Applied Economics, North Dakota State University, Fargo, ND.

Huber, J. and Klaus, Z. (1996). The Importance of Utility Balance in Efficient Choice Designs. *Journal of Marketing Research* 33, 307-317.

Johnson, R., Mathews, K., and Bingham, M. (2000). 'Evaluating Welfare-Theoretic Consistency in Multiple-Response, Stated Preference Surveys', paper presented at Japan Forum of Environmental Valuation, Conference on the Theory and Application of Environmental Valuation, January, Kobe, Japan.

Kelly, J., Haider, W., Williams, P., and Englund, K. (2006). Stated Preferences of Tourists for Eco-Efficient Destination Planning Options. *Tourism Management.* doi:10.1016/j.tourman.2006.04.015

Krueger, R. A. (1988). *Focus Groups: A Practical Guide for Applied Research.* Sage Publications, Newbury Park, CA.

Lawson, M. L. (1994). *Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux.* University of Oklahoma Press, Ok.

Lew, W. (1996). Tourism Management on American Indian Lands in the USA. *Tourism Management* 17, 355-365.

Lindberg, K., Dellaert, B. G. C., and Rassing, C. R. (1999). Resident Tradeoffs: A Choice Modeling Approach. *Annals of Tourism Research* 26 (3), 554-569.

Louviere, J.J. and Woodworth, G. (1983). Design and Analysis of Simulated Consumer Choice of Allocation Experiments: an Approach Based on Aggregate Data. *Journal of Marketin Research* 20, 350-367.

Louviere, J. J., Hensher, D. A., and Swait, J. D. (2000). *Stated Choice Methods: Analysis and Application.* Cambridge University Press, United Kingdom.

Luzar , E. J., Diagne, A., Gan, C., and Henning, B. (1995). Evaluating Nature-Based Tourism Using the New Environmental Paradigm. *Journel of Agriculture and Applied Economics* 27 (2), 544-555.

Mieczkowski, Z. (1995). *Environmental Issues of Tourism and Recreation.* University Press of America, Lanham, MD.

Moscardo, G. and Pearce, P. L. (1999). Understanding ethnic tourists. *Annals of Tourism Research* 26, 416-434.

Notzke, C. (2004). Indigenous Tourism Development in Southern Alberta, Canada. *Journal of Sustainable Tourism* 12 (1), 29-54.

Pindyck, R. S. and Rubinfeld, D. L. (1998). *Econometric Models and Economic Forecasts.* 4th Edition. Irwin/McGraw-Hill Publishing, Inc., Boston, MA.

Satterlee, J. L. and Malan, V. D. (1972). *History and Acculturation of the Dakota Indians.* Agricultural Experiment Station, South Dakota State University, Brookings, SD.

Schneider, I. and Salk, R. (2004). Leech Lake Area Summer Visitor Profile: A Focus on Interest in Culture and Nature-Based Experiences. University of Minnesota Tourism Center, St. Paul, MN. http://www.tourism.umn.edu/research/MAICCreport1.pdf

Schneider, M. J. (1990). *North Dakota's Indian Heritage*. University of North Dakota Press, Grand Forks, ND.

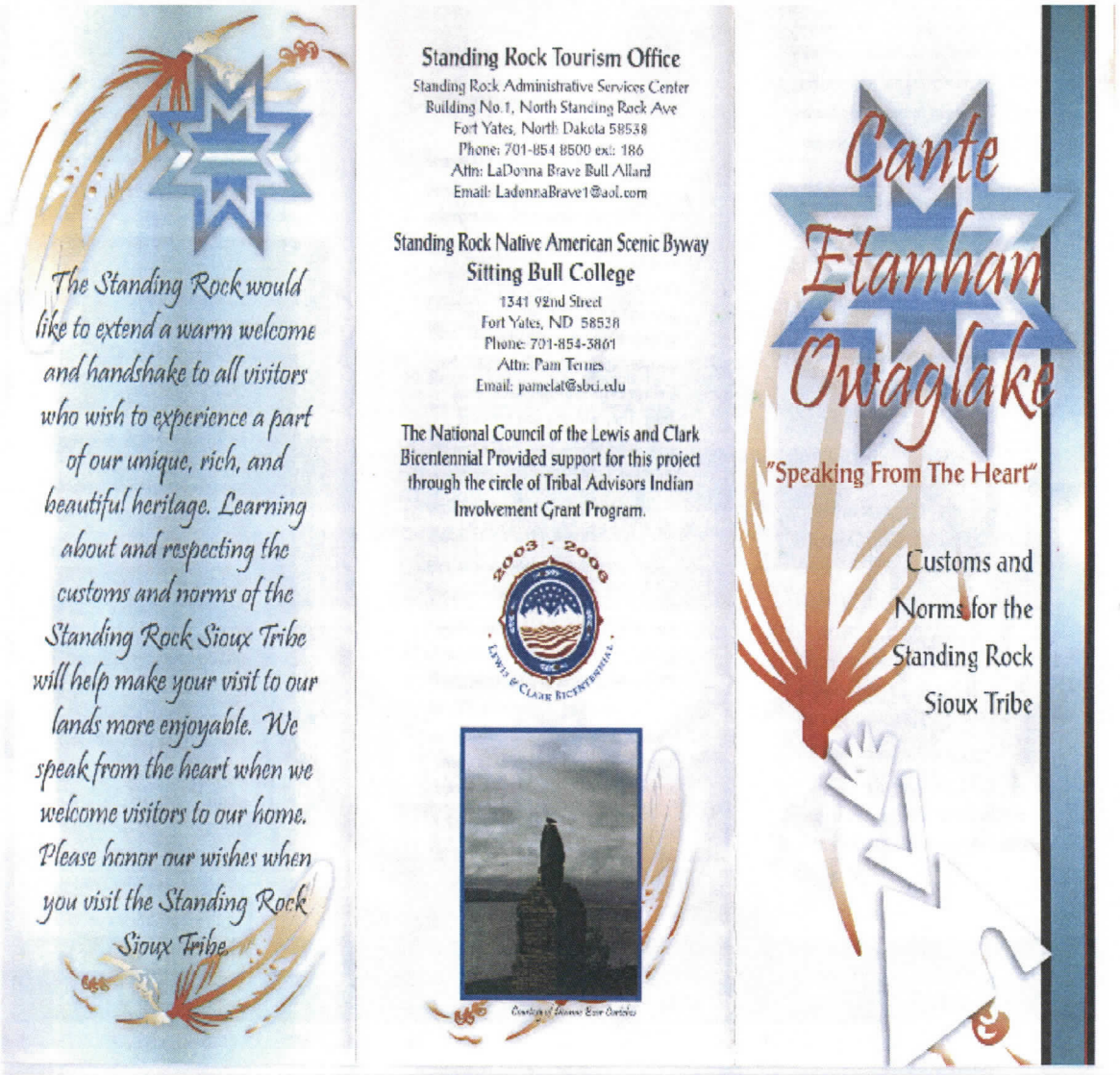
Standing Rock Tourism. (2005). National Native American Scenic Byway on Standing Rock. http://www.standingrocktourism.com/scenicByway/

Swait, J. and Louviere, J. (1993). The Role of the Scale Parameter in the Estimation and Comparison of Multinomial Logit Models. *Journal of Marketing Research* 30, 305-314.

Tiller, V. E. V. (1996). *Tiller's Guide to INDIAN COUNTRY*. BowArrow Publishing Company, Albuquerque, NM.

Wearing, S. and Neil, J. (1999). *Ecotourism: Impacts, Potentials and Possibilities.* Butterworth-Heinemann, Woburn, MA.

APPENDIX A. CUSTOMS AND NORMS DOCUMENT



The Standing Rock would like to extend a warm welcome and handshake to all visitors who wish to experience a part of our unique, rich, and beautiful heritage. Learning about and respecting the customs and norms of the Standing Rock Sioux Tribe will help make your visit to our lands more enjoyable. We speak from the heart when we welcome visitors to our home. Please honor our wishes when you visit the Standing Rock Sioux Tribe.

Standing Rock Tourism Office
Standing Rock Administrative Services Center
Building No.1, North Standing Rock Ave
Fort Yates, North Dakota 58538
Phone: 701-854 8500 ext: 186
Attn: LaDonna Brave Bull Allard
Email: LadonnaBrave1@aol.com

Standing Rock Native American Scenic Byway
Sitting Bull College
1341 92nd Street
Fort Yates, ND 58538
Phone: 701-854-3861
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Email: pamelat@sbci.edu

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2003 - 2006
Lewis & Clark Bicentennial

Cante Etanhan Owaglake

"Speaking From The Heart"

Customs and Norms for the Standing Rock Sioux Tribe

WAUNSILA

"Compassion"

Compassion for our ways:

1. Respect our privacy - do not knock on people doors to ask questions, do not interrupt our elders when they are talking. If you need to find some answers, contact the Sitting Bull College or the Standing Rock Sioux Tribe. They will give you names of appropriate people from the reservation that have knowledge of our culture.

2. All across Standing Rock there are sacred sites, memorials, burials and village sites. It is inappropriate to disturb or touch offerings placed at these sites such as tobacco ties, tobacco flags (pieces of cloth with tobacco in them for Prayer), food, rocks or other objects.

3. Many graves and burial sites are unmarked and can be happened upon accidentally. A burial site is considered sacred and must be left alone.

4. Please respect our decision about where you are allowed to go and not go on Standing Rock. Respect our decision to not allow you at some ceremonies. Some ceremonies are not open to the public and/or to non-natives. Please ask before you attend and never attend a ceremony unless invited.

5. Respect our people's wishes and do not take pictures unless you ask permission. No photos may be taken at ceremonies.

6. Respect our concept of time. Everyone arrives when they get there to a meeting.

7. Respect your host by taking the food or drink that is offered to you. Many of our people find it disrespectful to turn down food. It is also respectful to take food home with you after an event.

8. Respect our people and do not ask excessive questions or talk constantly. Do not talk loud or laugh loud during our ceremonies.

9. Respect our people by spending time with small talk before you start asking questions.

10. Respect our elders and leaders when asking for information by offering a small gift like tobacco (tobacco is considered sacred), or food before you ask questions.

11. Respect our humor - teasing, joking and laughing are a part of our culture.

12. Respect our people by dressing in a proper manner - unkempt appearance, short skirts, or shorts at ceremonies, feasts and other tribal events is considered disrespectful.

13. Respect our people who believe that direct eye contact is disrespectful by most elders and leaders of the communities. The people of Standing Rock lower their eyes as a form of respect.

14. Respect our belief that women on their moon time (menstruation) are forbidden to enter, be around or attend ceremonies, sacred sites, and gatherings where they will be praying with the pipe or around the drum at pow-wows.

15. Respect our belief that women must wear dresses or long skirts at Ceremonial events.

16. Respect our pow-wows and stand when we play the flag song, victory song and prayers.

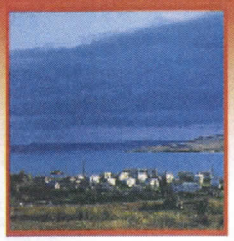
17. Respect ceremonies at the pow-wows when the announcer requests that no cameras be used during a ceremony.

18. Respect our people and stand when we give the meal prayer or pray for the people.

19. Respect our views and concepts that we have lived by because these rules have been with us since time immemorial.

20. Respect our decision not to answer some of your questions. We have things in our culture we would like to keep to ourselves.

21. Respect each and everyone you come in contact with and the world will be a better place.



YUONIHAN

"Respect"

Respect our laws:

1. Respect and obey our laws. Standing Rock has different levels of laws that govern the reservation. These laws include Tribal laws, Federal laws and laws from two States - North and South Dakota.

2. Respect our wildlife and do not hunt, unless you have obtained a tribal hunting or fishing license.

3. It is unlawful to trespass for any purpose on trust or private land without permission from the landowner or leaseholder.

4. Do not litter our environment. Clean up your campgrounds or picnic areas.

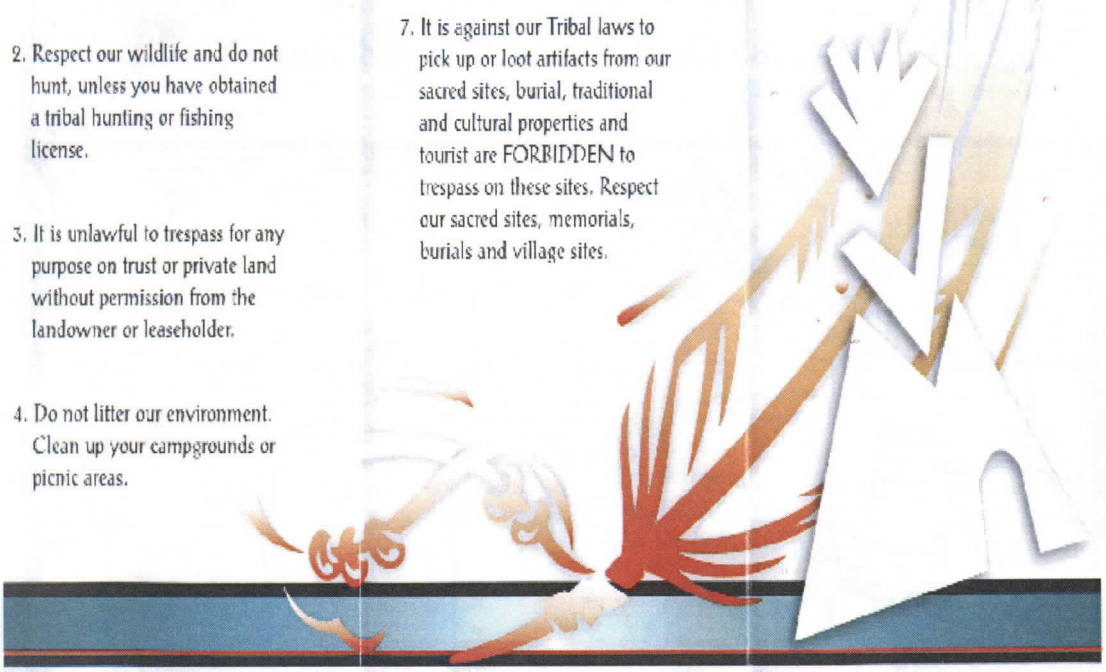
5. It is important to drive with caution through our communities. We have informal traffic laws in our small communities and many small children are playing.

6. It is unlawful to harvest, gather or remove plants, medicines, or trees without permission from the Standing Rock Sioux Tribe or Game and Fish Department.

7. It is against our Tribal laws to pick up or loot artifacts from our sacred sites, burial, traditional and cultural properties and tourist are FORBIDDEN to trespass on these sites. Respect our sacred sites, memorials, burials and village sites.

8. Please be cautious about smoking and campfires. Rangeland fires are a constant threat on the Prairie. Never throw your cigarette butt out the window and always put out campfires.

9. Respect our people and do not bring or use alcohol and drugs on the reservation. Alcohol and drugs are forbidden at all ceremonies, pow-wows and tribal events.



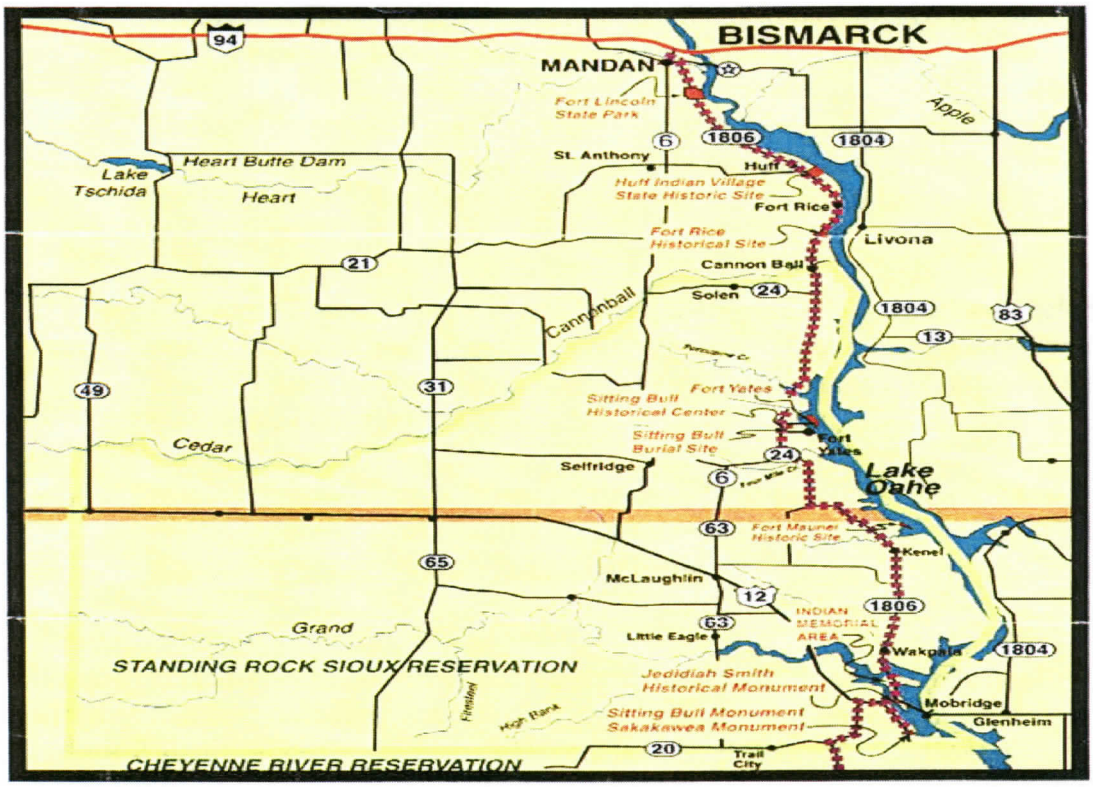
APPENDIX B. INFORMATION PACKET

STANDING ROCK SIOUX TRIBE

NDSU
NORTH DAKOTA STATE UNIVERSITY

SITTING BULL COLLEGE

The Standing Rock Sioux Indian Reservation



LEGEND

- State Line
- Reservation Boundary
- Site Locations
- Byway Route
- Secondary Roads
- State Road

Prepared by
LEASURE AND ASSOCIATES
Logan, ut.

The Standing Rock Sioux Indian Reservation straddles the border between North Dakota and South Dakota. The Standing Rock Sioux Indian Reservation is part of the Great Sioux Nation. The Hunkpapa and Sihasapa (Blackfeet) bands of Lakota (Teton) Sioux Indians comprise a large portion of the population on this reservation. The total land area of the Standing Rock Sioux Indian Reservation is 2.3 million acres and of that 1,408,061 million is tribally owned. The reservation was established in 1889 in the wake of the Great Plains Wars.

1. **Demonstration farm/ranch**: A place to learn about the natural link that exists between farming/ranching, great cooking and the natural environment associated with farming/ranching. The demonstration farm/ranch will offer visitors the opportunity to tour the farming/ranching facilities, gather on-site foods to be prepared by patrons, and helping in the day-to-day workings such as the herding of cattle.

    a. *Culinary farm/ranch tour*: By touring an area farm/ranch, you'll get an up-close look at the workings of a sustainable farm and also have the chance to ask local farmers/ranchers questions about Native American growing techniques.

    b. *Culinary farm/ranch tour & hands-on cooking class*: This package includes option 'a' above and a hands-on cooking class, where a Native American chef will use that day's fresh-from-the-farm/ranch bounty to help you make innovative culinary creations.

    c. *Culinary farm/ranch tour and cattle round-up*: This package includes option 'a' above while joining the farmer/rancher in the excitement of the day-to-day workings such as herding cattle.

2. **Bison Processing:** A large part of Native American Heritage, this buffalo herd stretches in a near unbroken line between grass and sky. Buffalo have a great historical significance for the Lakota/Dakota people. Before the incursion of European settlers, bison provided the people with food, clothing and shelter. After many years of absence, the bison are once again on Standing Rock.

d. *Hide tanning class*: This class will describe the art of tanning raw bison hides into robe size hides with the hair left intact. It will be a step by step description of the work process and also the use of bison hides.

e. *Authentic bison meal*: Enjoy an authentic home-cooked meal that includes local bison.

f. *Authentic bison meal and Hide tanning class*: This option includes option "a" and "b" from above.

3. Bison Herd Visit:

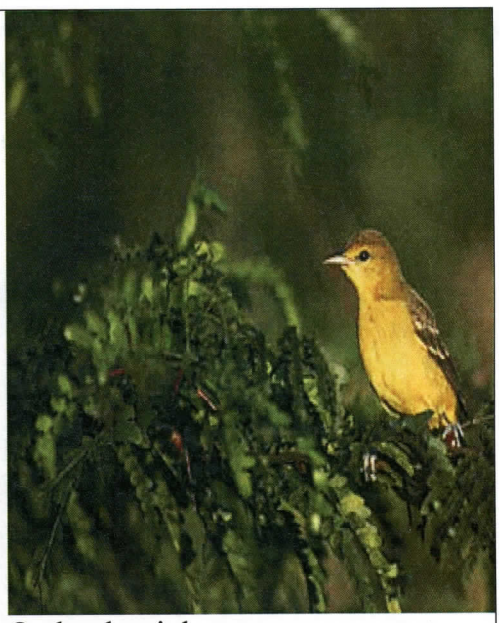
g. *Driving road through herd pasture*: This will be a road that transects the herd pasture and is available for drivers to drive their own vehicle through the herd pasture.

h. *Stagecoach ride through herd pasture*: This will offer tourists the opportunity to enjoy an authentic stagecoach ride through the bison herd pasture.

4. Trails: The following trails will be developed in regards to the specific levels that follow:

i. *Nature trail*: This trail would conform to those attributes sought after by those who wish to view native birds and plants. Visitors may view such species as:

Achillea millefolium



Orchard oriole

j. *Bike trail*: This trail would conform to those attributes sought after by cyclist.

k. *ATV trail*: This trail would conform to those attributes sought after by all-terrain-vehicle enthusiasts.

5. Tribal history:

l. *Interpretive signs at highway pullouts*: Interpretive signs would explain the cultural and historical significance of the geographical area.

Highway pullout.

m. *Interpretive center and Amphitheater show* : This will be a center staffed by locals who will offer oral as well as written historical information to patrons. While the amphitheater will offer an elaborately choreographed display of native peoples portraying some of the historic events in their tribal history.

Amphitheater.

APPENDIX C. ATTIBUTE EXPLANATION

***Culinary farm/ranch tour*:** By touring an area farm/ranch, you'll get an up-close look at the workings of a sustainable farm and also have the chance to ask local farmers/ranchers questions about Native American growing techniques.

***Culinary farm/ranch tour & hands-on cooking class*:** This package includes option 'a' above and a hands-on cooking class, where a Native American chef will use that day's fresh-from-the-farm/ranch bounty to help you make innovative culinary creations.

***Culinary farm/ranch tour and cattle round-up*:** This package includes option 'a' above while joining the farmer/rancher in the excitement of the day-to-day workings such as herding cattle.

***Hide tanning class*:** This class will describe the art of tanning raw bison hides into robe size hides with the hair left intact. It will be a step by step description of the work process and also the use of bison hides.

***Authentic bison meal*:** Enjoy an authentic home-cooked meal that includes local bison.

***Driving road through herd pasture*:** This will be a road that transects the herd pasture and is available for drivers to drive their own vehicle through the herd pasture.

***Stagecoach ride through herd pasture*:** This will offer tourists the opportunity to enjoy an authentic stagecoach ride through the bison herd pasture.

***Nature trail*:** This trail would conform to those attributes sought after by those who wish to view native birds and plants.

***Bike trail*:** This trail would conform to those attributes sought after by cyclist.

***ATV trail*:** This trail would conform to those attributes sought after by all-terrain-vehicle enthusiasts.

***Interpretive signs at highway pullouts*:** Interpretive signs would explain the cultural and historical significance of the geographical area.

***Interpretive center and Amphitheater show*:** This will be a center staffed by locals who will offer oral as well as written historical information to patrons; while the amphitheater will offer an elaborately choreographed display of native peoples portraying some of the historic events in their tribal history.

APPENDIX D. SOCIAL AND DEMOGRAPHIC DOCUMENT

INTRODUCTION

Dear respondents:

We are from the Department of Agribusiness and Applied Economics at North Dakota State University located in Fargo, ND.
This is a confidential survey of an academic nature to formally investigate and analyze the preferences of tourists as well as Reservation residents towards ecotourism development on the Standing Rock Sioux Indian Reservation. Nature-based tourism, also known as ecotourism or nature tourism, is defined as "tourism that consists of traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestation found in these areas". Ecotourism can be thought of as tourists who demonstrate stewardship to the culture and stewardship to the land.
This project is a collaborative research effort amongst North Dakota State University, Sitting Bull College, and the Standing Rock Sioux Tribal Tourism Office. This research is part of a Thesis Project to obtain a Master of Science degree in Natural Resources Management carried out by Sheldon Tuscherer. If you would like more information regarding this research, you can contact me at sheldon.tuscherer@ndsu.edu.

GENERAL QUESTIONS

1. Have you ever visited the Standing Rock Sioux Indian Reservation?

   a. Yes ( )
   b. No ( )

2. If you have visited, was your visit organized through a tour operator?

   a. Yes ( )
   b. No ( )

3. Amongst the following options, please mark the **ONE** that is your main tourism interest.

   a. Family ( )
   b. Hunting and Fishing ( )
   c. Cultural, Historical, Educational ( )

d. Nature based (non hunting and fishing) ( )
e. Amusement parks ( )
f. Gaming ( )
g. Other ( )

Please indicate:_____

4. Your appreciation of the Dakota/Lakota culture and the natural resources found on the reservation depends upon the information that is provided to you by reservation personnel.

a. Agree ( )
b. Indifferent ( )
c. Disagree ( )
d. Don't know ( )

5. The cultural and natural resources information that you are provided with through brochures and highway interpretive signs is sufficient to learn about the Dakota/Lakota culture and the natural resources you are observing on the Reservation.

a. Agree ( )
b. Indifferent ( )
c. Disagree ( )
d. Don't know ( )

6. There should be greater development of ecotourism on the reservation.

a. Agree ( )
b. Indifferent ( )
c. Disagree ( )
d. Don't know ( )

7. With the development of ecotourism on the reservation, the sacredness of the Dakota/Lakota culture will be compromised.

a. Agree ( )
b. Indifferent ( )
c. Disagree ( )
d. Don't know ( )

8. My visit to the reservation for ecotourism would be diminished by the lack of family activities offered to my family.

a. Agree ( )
b. Indifferent ( )
c. Disagree ( )
d. Don't know ( )

9. Are you a resident of: **(Mark one only)**

a. Standing Rock Sioux Indian Tribe ( )
b. ND ( )
c. SD ( )
d. MN ( )
e. Other US ( )
f. Europe ( )
g. Other country ( )
h. Other tribe ( )

10. Mark with an X your gender

a. Male ____ b. Female ____

11. Mark with an X your age

1.	18 – 29 years	
2.	30 – 39 years	
3.	40 – 49 years	
4.	50 – 59 years	
5.	More than 59 years old	

12. Mark with an X the highest level of education you have completed

1.	Elementary school	
2.	High School	
3.	Technical College	
4.	University	
5.	Postgraduate School	

13. Please mark with an X which of the following ranges your annual income falls into (remember, this information is confidential).

Under $20,000	
$20,000 – $40,000	
$40,000 - $60,000	
$60,000 - $80,000	
More than $80,000	

14. Please mark with an X the number of days per year you dedicate to tourism.

1.	0 – 10	
2.	11 – 20	
3.	21 – 30	
4.	31 – 40	
5.	More than 40 days	

CHOICE EXPERIMENTS

We have three hypothetical options (choice sets) in each of the following four sheets of paper: option A, B, and C. Together, these options represent a choice experiment. Each individual should choose between one of these options considering the differences that exist in the levels offered for each attribute or, you may choose "I prefer done of the above options". Each sheet of paper is an independent choice experiment with three choice sets being offered. You are asked to carry out this exercise four times with four different choice experiments being offered.

APPENDIX E. SAMPLE CHOICE EXPERIMENT DOCUMENT

ATTRIBUTE	OPTION A	OPTION B	OPTION C
DEMONSTRATION FARM/RANCH	Culinary farm/ranch tour	Culinary farm/ranch tour and cattle round-up	Culinary farm/ranch tour and hands-on cooking class
BISON PROCESSING	No bison processing	Authentic bison meal and hide tanning class	Hide tanning class
BISON HERD VISIT	Driving road through herd pasture	No herd visit	Stagecoach ride through herd pasture
TRAILS	Nature trail	ATV trail	Bike trail
TRIBAL HISTORY	Interpretive signs at highway pullouts	Interpretive signs at highway pullouts	No history presentation
PRICE (dollars)	160	120	200

Option A ____ Option B ____ Option C ____

I prefer none of the above options ____

ATTRIBUTE	OPTION A	OPTION B	OPTION C
DEMONSTRATION FARM/RANCH	Culinary farm/ranch tour	Culinary farm/ranch tour and hands-on cooking class	No farm/ranch visit
BISON PROCESSING	Authentic bison meal	Authentic bison meal and hide tanning class	Authentic bison meal and hide tanning class
BISON HERD VISIT	Stagecoach ride through herd pasture	Driving road through herd pasture	No herd visit
TRAILS	Nature trail	No trail	Nature trail
TRIBAL HISTORY	Interpretive center and amphitheater show	No history presentation	Interpretive center and amphitheater show
PRICE (dollars)	120	80	80

Option A ____ Option B ____ Option C ____

I prefer none of the above options ___

ATTRIBUTE	OPTION A	OPTION B	OPTION C
DEMONSTRATION FARM/RANCH	No farm/ranch visit	Culinary farm/ranch tour and hands-on cooking class	Culinary farm/ranch tour
BISON PROCESSING	No bison processing	Hide tanning class	Authentic bison meal
BISON HERD VISIT	No herd visit	No herd visit	Driving road through herd pasture
TRAILS	No trail	ATV trail	No trail
TRIBAL HISTORY	Interpretive signs at highway pullouts	Interpretive signs at highway pullouts	No history presentation
PRICE (dollars)	120	80	200

Option A ____ Option B ____ Option C ____

I prefer none of the above options ___

ATTRIBUTE	OPTION A	OPTION B	OPTION C
DEMONSTRATION FARM/RANCH	No farm/ranch visit	Culinary farm/ranch tour	Culinary farm/ranch tour and cattle round-up
BISON PROCESSING	Authentic bison meal	Hide tanning class	No bison processing
BISON HERD VISIT	No herd visit	Stagecoach ride through herd pasture	Driving road through herd pasture
TRAILS	ATV trail	Bike trail	Bike trail
TRIBAL HISTORY	Interpretive center and amphitheater show	Interpretive center and amphitheater show	No history presentation
PRICE (dollars)	160	160	200

Option A ____ Option B ____ Option C ____

I prefer none of the above options ___

APPENDIX F. IRB CONSENT FORM

Dear Respondent:

My name is Sheldon Tuscherer. I am a Natural Resources Management graduate student in the Department of Agribusiness and Applied Economics at North Dakota State University. I am conducting a research project to explore the status of reservation ecotourism development on the Standing Rock Sioux Indian Reservation (SRSIR). This project is a collaborative research effort amongst North Dakota State University, Sitting Bull College, and the Standing Rock Sioux Tribal Tourism Office. Results of this study will help us learn more about tourist's preferences towards ecotourism attractions within the SRSIR.

You are invited to participate in this research study. Your participation is entirely voluntary, and you may withdraw from participation at any time.

It should take about 15 – 20 minutes to complete the oral question and answer session.

Your identity will not be revealed in the experiment results. Only group comparisons will be made and reported in summary form.

If you have any questions about this project, please call me at (701) 231-6494, or call my adviser, Dr. Robert Hearne at (701) 231-6494. Or, you may email either of us at Robert.Hearne@ndsu.edu, or Sheldon.tuscherer@ndsu.edu. If you have questions about the rights of human participants in research, or to report a problem, you should contact the NDSU IRB Office, (701) 231-8908.

Thank you for your participation in this study. If you wish to receive a copy of the research results, please contact either myself or Dr. Robert Hearne.