The Economic Value of Wildlife in Alberta: A Database and Analysis of Benefit and Expenditure Estimates

B.C. Rush, W.E. Phillips and W.L. Adamowicz

Project Report 96-01

Final Report for Wildlife Management Division
Alberta Environmental Protection

The authors are, respectively, Graduate Student, Professor Emeritus and Professor, Department of Rural Economy, University of Alberta, Edmonton.

RURAL ECONOMY

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Department of Rural Economy
Faculty of Agriculture & Forestry,
and Home Economics
University of Alberta
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EXECUTIVE SUMMARY

The "Wildlife Valuation Database" is composed of 53 individual studies, providing 181 wildlife and recreation benefit estimates. The database can be run on a IBM compatible computer with Microsoft Windows 3.1. The format of the database is in the following form; (a) ID number, (b) focus of study (for example, hunting and fishing), (c) author(s), (d) date published, (e) species (for example, moose and wolf), (f) geography (for example, is the study representative of a region or province), (g) sample size, (h) data year, (i) valuation technique (such as travel cost models and contingent valuation methods), (j) beneficiaries (for example, are the beneficiaries Canadians or Non-Canadians), (k) benefit value, (l) benefit value in 1994 dollar terms, (m) denominations (such as benefit values per year or per day), (n) survey characteristics (inclusive: demographics, expenditures, trips made, distance traveled, duration, party size, substitute site, family income, value of time and survey used), (o) license fees, (p) variable costs (food, lodging and travel costs), (q) capital costs, and (r) total expenditures.

The majority of the entries in the database are from Alberta studies (47%). The composition of the rest of the database is as follows; other Canadian provinces (British Columbia, Saskatchewan, Ontario, Quebec, and Newfoundland) represent 23% of the data; Canadian wide and United States studies represent 6% and 24% of the data respectively. Most of the studies were consumptive in nature, such as hunting and fishing, followed by non-consumptive activities, such as hiking.

Identified gaps within the database literature are (a) very few bequest and existence valuation studies, (b) few studies that analyze quality changes (with respective changes to benefit estimates and expenditures) due to positive/negative environmental impacts, (c) the exclusion of expenditures from many studies, and (d) the issue of successfully deriving capital costs per unit studied.

The majority of the wildlife valuation reports were completed between the late 1960's through to the 1980's. Out of the 53 entries in the wildlife database, 43 were executed between 1968 and 1989, and the remaining 10 studies were completed in the 1990's. The vast amounts of reports done from the late 1960's to the late 1980's, resulted from the growth of environmental litigation and benefit transfer policies.

The benefit values and total expenditures were converted to 1994 dollars for ease of comparison. The range of benefit values for per day, per trip, and per year of hunting activities are $11-$500, $34-$396,and $76-$1553 respectively. The range of benefit values for fishing activities are $16-$132/day, $35-$66/trip, and $33-$403/year. Similarly, the benefit values for non-consumptive activities vary from $1-$11/day, $45-$342/trip, and $120-$486/year. The values of total expenditures for hunting activities range from $22-$645/day, $51-$699/trip, and $259-$3081/year. Fishing activities provide total expenditures ranging from $567-$2867/trip, and $1-$1497/year. Lastly, total expenditures for non-consumptive activities vary form $1-$257/trip, and $1497-$5567M/year.

Median values (or the central/mid point value) for total expenditures in 1994 dollars can be expressed across all studies. The median value for the total expenditures per trip across all studies is $51 and the mid point for total expenditures per day and per year across all studies are $204 and $1268 respectively.

The wildlife database provides a comprehensive synthesis of benefit estimates that can be used for processes such as benefit transfers. The data can also be used in meta-analysis to provide information on wildlife benefit estimate variability.

CHAPTER I INTRODUCTION

A. The Use of Wildlife and Wildlife Related Values

Since the early 1970's, there has been a major focus on the value of wildlife and recreation. Increasingly, these values have been incorporated into wildlife management decisions. Perhaps the most common applications of wildlife values in management decisions occur in litigation and court cases, and they are used for assessing fines for illegally-taken game. They also help to determine the real and positive effects on local communities that depend upon their wildlife assets. Most recently, wildlife values have been used to determine benefit transfers between regions that are similar in environment.

Benefit transfer is the developing art of estimating the demand for wildlife and recreation in new or revised areas by using existing information on sites having similar physical and/or ecological qualities. Reference data can be derived from within the country under study (other regions in Canada, for example) and from other countries (such as the United States).

The emphasis on wildlife valuations as a factor in management decisions has fostered a vast number of studies. This research project summarizes, consolidates, and synthesizes the past wildlife benefit studies. Consolidating and synthesizing the literature on wildlife valuations is important on two accounts. Creating an up-to-date database of wildlife studies can provide a framework in which management decisions can be made and compared. Secondly, identifying knowledge gaps will provide a basis in which resources (money and effort) can be efficiently allocated. By identifying the species and regions that need to be further researched, completion of the Canadian wildlife database can be achieved.

B. Report Syllabus

Chapter II provides a brief overview on utility theory.

Chapter III relays the methods of data collection, database design and summary of the data in table form. The section ends with discussion on how to access and update the database.

Chapter IV identifies the knowledge gaps that exist within the wildlife literature. Such identification will provide a means of determining further research needs.

Chapter V contains a brief history and introduction of meta-analysis. The section explores the application of meta-analysis to the data, the results and implications of such an analysis. The chapter ends with a conclusion on data analysis and how it pertains to policy decisions.

Chapter VI reveals other current and relevant work in the area of Environmental Valuation Databases.

The final chapter, Chapter VII, provides a summary and conclusion on the database, research needs and final comments on the research area.

CHAPTER II THEORETICAL BACKGROUND

A. Utility Theory

Land areas (including forests and wildlife habitat) are composed of goods and services that are often valued by market forces or by alternative techniques. Forest products such as timber, and the products of trapping and grazing, derive their values from the effects of supply and demand within the market. Other forest services, such as ecosystems, hunting, fishing, hiking and outdoor recreation, are not traded in markets and, therefore, must be valued by such methods as the travel cost model, contingent valuation methods, and hedonic pricing models[1].

The value of market and non-market goods are important to know when addressing development decisions. Economic tools, such as benefit cost analysis, which are used to determine if resources are being used to their highest value and best use, require monetary values for both timber and non timber resources. The values assigned to each type of resource serve as the base upon which managers can compare the benefits and costs of proposed decisions.

The need to determine compensation for damage to the environment has recently emerged as another reason for determining the value of non-market goods. Individuals and firms are now held liable for damages accrued to environmental assets. For example, residents along the Alaskan coast line were awarded $287 million in compensation for the Exxon Valdez oil spill. This amount was derived through non-market valuation methods, which are now being used in court cases in both Canada and the United States.

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[1] For a complete discription on non-market valuation techniques, refer to W.L. Adamowicz's Project Report 92-02.

The literature on non-market valuation identifies "use values" and "non-use values". Use value are those that an individual holds with respect to his/her participation in a specific activity (Adamowicz, 1992), and are classified as either being consumptive or non-consumptive. Activities such as hunting and fishing are considered consumptive. Non-consumptive use values represent activities such as bird watching and hiking which do not detract or affect the resource.

Existence values and bequest values are the two types of non-use values that are held by individuals with respect to those goods or services that are not under active consumption. Existence values are derived from the knowledge that the good exists even though an individual may never use (or visit) it (for example, the Rocky Mountains). Bequest values represent the value that an individual places on the knowledge that the good will be passed on to future generations (such as Alberta wilderness).

Individual demand for wildlife and recreational activities is affected by factors such as tastes and preferences, distance traveled, the price and type of available substitutes, the quality of the site, and species abundance. People demand both timber and non-timber goods; hence, the market values of timber goods are derived from supply and demand transactions, and non-timber goods are valued through other techniques. It is important to understand the nature of the relationships among non-use values, use values, market values, environmental control services and global elements, in that each factor may influence the other and, consequently, have an impact on the quantity demanded for a particular good or service.

The relationship between market and non-market values, environmental control services and global elements can be outlined as follows; market values such as timber production and grazing can have a positive or negative effect on non-market values. Timber production may necessitate a reduction in the size of the wildlife habitat and ultimately affect the population's

demand for non-market activities such as camping and hiking. At the same time, market values and use values are linked to regional impacts, including tourism, employment, and other community issues. Environmental control services and global elements also play roles in market and non-market values. Environmental control services refer to the forests ability to sustain itself by providing erosion control and maintaining water quality and the ecological system. A change in any one of these control systems will affect both market and non-market values. For example, a negative change to the wildlife habitat could be detrimental to activities such as fishing and bird watching; similarly, a change in erosion control could affect timber production and values. Global linkages (the world's water and land resources and atmosphere) also interact with environmental control systems. Indeed, global concerns such as acid rain and pollution can affect the growth of local forests, as the removal of local forests can affect the global environment.

Each of these elements interact, thereby affecting the demand for wildlife and recreational activities on an individual and societal levels. By becoming aware of such factors, the "black box" called human behavior can be increasingly understood.

CHAPTER III DATABASE DESIGN

A. Data Collection

The database included studies undertaken in Alberta and other Canadian provinces, as well as some northwestern U.S. states from 1968 to 1994. The studies were collected from a number of sources including; Master's Theses, Doctoral dissertations, government reports, journal articles, personal copies of the published and unpublished works of professors and other professionals, national surveys, entries from previous databases, information from tourism agencies, and conference papers. The data were compiled over a 15 month time period, providing a total of 53 individual studies and 181 wildlife benefit estimates. A complete annotated bibliography of all studies included in the database is presented in Appendix B.

B. Database Design

The database was created on MS Works and the format of the database includes the following variables; ID number, focus of study (for example, hunting and fishing), author(s), date published, species (such as wolf or elk), geography (is the study conducted in a specific region or province), sample size, data year, valuation technique (such as the travel cost model and contingent valuation method), beneficiaries (are those who benefit from Canada or elsewhere), benefit value, benefit value in 1994 dollar terms, denominations (for example, per day, per year or per trip), survey characteristics (inclusive: demographics, expenditures, trips made, distance traveled, duration, party size, substitute site, family income, value of time and survey used), license fees, variable costs (food, lodging and travel costs), capital costs, and total expenditures. Table 3.1 provides a comprehensive outline of the database by defining the method of coding. A sample copy of the database and corresponding code sheet appear in Appendix C.

TABLE 3.1: DESCRIPTION OF VARIABLES IN DATABASE

VARIABLE NAME	VARIABLE DESCRIPTION
Focus of study	Descriptive Variable: 9 Categories
Species	Descriptive Variable: 26 Categories
Date Published	Years range from 1970 to 1995
Geography	Descriptive Variable:7 Categories
Sample Size	Census data and Sample Size, ranging from 55 to 818,800
Data Year	Years range from 1968 to 1994
Contingent Valuation Method (CVM)	Qualitative Variable=0 Not Applicable Qualitative Variable=1 open-ended questions Qualitative Variable=2 closed-ended questions
Willingness To Pay (WTP)	Qualitative Variable=0 Not Applicable Qualitative Variable=1 If Applicable
Willingness To Accept (WTA)	Qualitative Variable=0 Not Applicable Qualitative Variable=1 If Applicable
Travel Cost Model	Qualitative Variable=0 Not Applicable Qualitative Variable=1 If Applicable
Hedonic Price Model	Qualitative Variable=0 Not Applicable Qualitative Variable=1 If Applicable
Beneficiaries	Descriptive Variable:5 Categories
Denominator Value	Descriptive Variable:9 Categories
Benefit Value	Qualitative Value in Dollar Terms
Benefit Value (1994$)	Qualitative Value in 1994 Dollars
Survey Characteristics	Qualitative Variable=0 Not Applicable Qualitative Variable=1 If Applicable
License Fee	Qualitative Value in Dollar Terms
Variable Costs	Qualitative Value in Dollar Terms
Capital Good(s)	Descriptive Variable:7 Categories
Capital Good Value	Qualitative Value in Dollar Terms
Total Expenditures	Qualitative Value in Dollar Terms
Total Expenditures (1994$)	Qualitative Value in 1994 Dollars

C. Summary of Data

In total, there are 53 individual studies in the database. Most of the studies included in the database were those that pertained to Alberta wildlife and recreation, but the focus was later expanded to include Canadian wildlife and recreation. Therefore, reports executed in Alberta, other Canadian provinces and boarder U.S. states were included. Table 3.2 describes the origin of the 53 studies. Alberta studies composed 47% of the database, other Canadian studies (including studies done in Ontario, British Columbia, Saskatchewan, Newfoundland and Quebec) composed 23% of the data, Canadian wide and U.S. studies represented 6% and 24% of the data respectively.

TABLE 3.2: ORIGIN OF STUDIES

ORIGIN OF STUDY	NUMBER OF STUDIES
B.C.	4
Alberta	25
Saskatchewan	2
Ontario	4
Quebec	1
NFL	1
Canada Wide	3
U.S.	13

The focus of the studies were mostly consumptive in nature. Table 3.3. shows the break down of the consumptive and non consumptive reports in the database. Of the 53 entries, 23 studies dealt with hunting. Hunting includes the following species; mountain sheep, moose, grizzly bear, mountain goat, elk, black bear, deer, antelope, caribou, upland birds, waterfowl, migrating birds, pheasant, bird game, cougar, wolf and unspecified hunting.

Eleven of the 53 studies were done on fishing which includes the following species; bass,

cold water fishing, warm water fishing, sport fishing and unspecified fishing.

Eight studies were performed on existence values, one reported on the value of habitat, and 14 studies examined non-consumptive activities, which incorporates all wildlife viewing and recreational activities.

TABLE 3.3: SUMMARY OF STUDIES COLLECTED

Focus of Study	*Number of Studies
Hunting (All)	23
Fishing (All)	11
Existence Values	8
Non Consumptive Activities	14
Value of Habitat	1

*Some include more than one focus of study.

The 53 wildlife benefit reports used three main techniques in valuing wildlife and recreation: (a) the Contingent Valuation Method (CVM), including Willingness to Pay (WTP) or Willingness to Accept (WTA); (b) the Travel Cost Model (TCM); and (c) the Hedonic Pricing Model. Table 3.4 summarizes the studies collected in terms of their valuation type. Among the 53 studies, 41 contained CVM benefit estimates giving 51 WTP and two WTA estimates; 15 contained TCM estimates and two contained Hedonic Pricing estimates. Several studies contained more than one type of estimate.

TABLE 3.4: TYPE OF STUDIES COLLECTED

Study Type		*Number of Studies
CVM		41
	WTP	51
	WTA	2
TCM		15
Hedonic		2
Other		0

*Some include more than one study type.

The database allows the wildlife benefit value to be categorized into nine different denominator values. The following table, table 3.5, describes the benefit value in 1994 dollar terms as one of the most common three denominations (person/day, person/trip, person/year). Again, hunting, fishing and non consumptive activities represent broad categories.

TABLE 3.5: RANGE OF VALUES FOR VARIOUS DENOMINATIONS (1994 $)

Focus of Study	Per Day	Per Trip	Per Year
Hunting (All)	11 - 500	34 - 396	76 - 1553
Fishing (All)	16 -132	35 - 66	33 - 403
Existence Values	N/A	N/A	15 - 90
Non Consumptive	1 - 11	45 - 342	120 - 486
Value of Habitat	N/A	N/A	N/A

Table 3.6 below is a bibliographical table outlining the authors, date published, study type, ranges of the benefit value (1994$), denominations, and total expenditures (1994$) of the 25 Alberta studies found in the Canadian Wildlife Database. The Alberta relevant information from the three Canada wide studies, completed by the Federal-Provincial Task Force, are also included.

TABLE 3.6: BIBLIOGRAPHICAL TABLE

Authors	Date	Study type	Value (1994$)	Denomination	Total Expend. (1994$)
Adamowicz	1983	hunting	91 - 188	per/day	324 -2819/yr
Adamowicz et al	1986	hunting	121 - 236	per/day	N/A
Alberta Forestry	1985	fishing	33	per/yr	567/tr
Asafu-Adjaye	1986	hunting	142	per/day	N/A
Asafu-Adjaye	1989	existence/econ. value	57 - 348	per/yr	N/A
Bodden et al	1986	hunting	23 - 32	per/day	N/A
Boxall et al	1991	bird count	37	per/tr	11 - 13(Av/count)
Boxall et al	1995	recreation	58	per/tr	N/A
Boxall	1995	hunting	5,964-41,892	group/yr	N/A
Dev't. Planning	1970	recreation	172,809-2,598,950	Prov/yr	N/A
English et al	1984	fishing	30	per/day	N/A
Macnab et al	1993	habitat value	73 - 100	group/yr	N/A
Miller	1971	hunting/fishing	33 - 43	per/day	283/yr
Pattison	1970	hunting	19 - 57	per/day	1039/yr
Phillips et al	1977	recreation	8 - 11	per/day	N/A
Phillips et al	1977	recreation	28 - 1,553	per/day & yr	259 - 497/yr
Phillips et al	1977	fishing	250	per/yr	N/A
Phillips et al	1977	recreation	306 - 403	per/yr	N/A
Phillips et al	1978	recreation	1.2 B	Prov/yr	N/A
Prather	1974	hunting	27 - 500	per/day	N/A
Thompson et al	1987	recreation	4 - 9	per/day	10 - 16/tr
Thompson et al	1987	existence/recreation	1 - 34	per/day & yr	1/tr
Thompson et al	1987	fishing	N/A	N/A	2867/tr
Wilman et al	1987	recreation	12	per/exper.	N/A
Wilson	1983	hunting	11 - 19	per/day	N/A
Federal Task For.	1981	economic value	200M	Prov/yr	N/A
Federal Task For.	1987	economic value	149M	Prov/yr	N/A
Federal Task For.	1994	economic value	83M	Prov/yr	835M/yr

Note: The denomination "per/day" represents the benefit value per person per day.

The database provides information on expenditures that accrue from participating in wildlife activities, such as hunting, fishing, and non-consumptive (recreational) activities. Table 3.7, summarizes total expenditures (in 1994 dollars) into three categories; as per year, per trip, and per day.

TABLE 3.7: RANGE OF TOTAL EXPENDITURES (1994$)

Activity	Per Year	Per Trip	Per Day
Hunting (All)	259 - 3081	51 - 699	22 - 645
Fishing (All)	1 - 1497	567 - 2867	N/A
Non-Consumptive Activities	1497 - 5567M	1 - 257	N/A

Along with total expenditures, reported capital costs (the goods and their value) can also be summarized in tabular form. Referring to the following table, Table 3.8, will clarify the type of capital goods that have been reported coupled with the values of these goods in either a per trip, per day, or per year basis. The category "General Equipment" includes elements such as clothing, fish bait, and vehicles.

TABLE 3.8: CAPITAL GOODS AND VALUES (1994$)

Capital Good	Value (1994$)
Rifles & Ammunition	10/trip 10 - 60/day 17 - 94/yr
Camping Gear	13/trip
Binoculars	N/A
General Equipment	3 - 722/trip 2/day 79 - 1506/yr
Camera & Film	N/A
Rental Costs	N/A
Unspecified Goods	28M - 39M/trip

The calculation of the median or mid point value for total expenditures (in 1994 dollars) can be expressed on a per trip, per day and per year basis. The median value for total expenditures across all studies as a per trip denomination is $51 and the mid point values on a per day and per year basis are $204 and $1268 respectively.

TABLE 3.9: MEDIAN VALUES FOR EXPENDITURES

Demonination	Value
Per Trip	$51
Per Day	$204
Per Year	$1,268

D. Update and Access of Database

The database was compiled on Microsoft Works for windows and is fairly easy to use. The database is called the "Wildlife Database", and it was supplied to the Alberta Fish and Wildlife Division in disk form. The database will run on any IBM compatible computer that has Microsoft Windows 3.1. Two "views" were created for simplicity, the list view and form view. The form view should be accessed when new studies are added to the database. The list view provides an easy to understand consolidation of the included studies. A more comprehensive description on how to access and update the database will be supplied in Appendix A.

CHAPTER IV KNOWLEDGE GAPS

A. Further Research Needs

The Canadian Wildlife Database not only presents a consolidation of known studies, it also clarifies gaps within the literature. Identifying these knowledge gaps provides a basis in which resources, such as money and effort, can be efficiently allocated. This database exhibits four deficient areas which are (a) non-use valuations, (b) quality changes, (c) expenditures, and (d) capital cost issues. Focus into these four areas will help in completing the Canadian Wildlife Database in terms of it's effectiveness in answering benefit transfer questions and other policy related issues.

The first area that needs to be further examined is non-use valuation studies. Issues such as bequest values (knowing that particular environmental goods and services will be passed down to future generations) and existence values (that environmental goods and services have values regardless if one visits or uses it) are difficult to address. The difficulty lies in the non-familiarity of the area examined. Many hunters and anglers are able to place adequate values on familiar activities such as hunting and fishing, but non-use values are not familiar and therefore, hard to value. Furthermore, the values that are derived for non-uses goods (by CVM) have no way of being measured in accuracy for market simulations are extremely difficult if not impossible. Regardless of the difficulty in valuing non-use goods and services, more attempts still need to be made, for they provide a large part of the world's environmental arena.

A second, and not quite so complex, area of deficiency deals with quality changes. This area of research is quickly being adopted, and a few quality change studies do exist in the database (Morton, 1993). Positive and negative environmental changes affect both benefit values

and expenditures, and these value fluctuations must be identified. Environmental changes do represent real world scenarios, and valuing such situations is another significant area of research.

The final two research issues relate to accumulating data on expenditures and capital costs per unit studied. Many of the studies within this database lack complete information in this area. To rectify incomplete expenditure knowledge simply requires a few extra questions to be included on the CVM surveys. Obtaining data on capital costs may prove to be more difficult. The questions pertaining to the type and amount of money spent on capital goods must be clear, for obscure questions my lead to participants lumping all past capital purchases into the value provided. More specifically, questions should capture only those capital purchases that individuals bought for the activity that is under investigation. A further note with regards to capital goods is the inability of the researchers to estimate the depreciation of goods such as trucks, boats and all terrain vehicles.

As a final note, along with the issues of non-use values, quality changes, expenditures and capital costs; positive and negative impacts on regions are hard to calculate due to the lack of information. More regional analysis is needed to rectify this problem.

Focus into these four areas of further research will help strengthen and broaden the scope of this Canadian Wildlife Database. Furthermore, the database will provide complete knowledge so sound policy decisions can be formulated.

The next chapter contains excerpts from Meta-Analysis of Wildlife Benefit Estimates in a Canadian Context (Rush,1995). The chapter illustrates a potential use of the database by presenting a meta-analysis on a selected sample of valuation studies from the Wildlife Valuation Database.

CHAPTER V POTENTIAL USES OF THE DATABASE

A. Introduction to Meta-Analysis

The synthesis of results from many types of research is a meta-analytical technique, which is a powerful tool used in the social, behavioral, and physical sciences to make sense of the vast amounts of data that have accumulated over the years. Many argue that additional empirical data are no longer needed; what is required is a mechanism to generalize these past results. This cumulative knowledge can give new insights into conflicting results and provide a foundation upon which policies can be based. Therefore, meta-analysis has been embraced by many areas of research, including industrial-organizational theory, psychology, medicine, physics, health care, education, and finance. Evidence shows that meta-analysis is also entering the fields of economics, marketing, and human resources. The rapid adoption of meta-analytical techniques is likely to continue as its characteristics are revealed. In reviewing methods of meta-analysis, Bangert-Downs (as quoted in Schmidt) concluded that:

> Meta-Analysis not a fad. It is rooted in the fundamental values of the scientific enterprise: replicability, quantification, causal and correlational analysis. Valuable information is needlessly scattered in individual studies. The ability of social scientists to deliver generalizable answers to basic questions of policy is too serious a concern to allow us to treat research integration lightly. The potential benefits of meta-analysis method seem enormous (Schmidt, 1990. p. 41).

How does meta-analysis work? Meta-analysis investigators must first collect all information that is relevant to a specific issue. Then, at least one indicator of the relationship under investigation is constructed from each of the studies collected. These "study level" indicators can be used to compute an array of statistical variables, such as means and standard deviations. Study level data (or accumulated data) can be analyzed like any other data, such as primary data. A variety of quantitative methods can be used to answer a wide range of questions.

B. Application of Meta-Analysis to the Data

Since the 1980's, there has been an attempt to fill the gaps in the literature with respect to benefit estimation. The trend toward benefit cost analysis and environmental litigation has fueled this effort. The benefit estimates themselves maybe used for benefit transfers, but generalized results can also address large-scale policy questions. Meta-analysis gives researchers the basis upon which to test the systematic relationship between benefit values and survey characteristics.

The basic empirical hypothesis of my thesis is that variation of benefit values can be explained by (a) the types of survey questions asked, (b) type of estimation models used, (c) the year of the study and (d) the country in which it was conducted, (e) whether the questions were of the "willingness to pay" or "willingness to accept" variety, (f) the format of the questions (*ie* open- or closed-ended), and (g) the study type (its examination of consumptive verses non-consumptive activities). The analysis was executed on 25 wildlife benefit reports, providing 92 benefit values.[2] The analysis uses predominately Canadian data; for example, there are 13 studies on Alberta, three studies on Ontario, and two reports on British Columbia. The remaining seven reports were executed in the United States (Idaho and Maine).

C. Results

The regression was estimated by using linear and log linear ordinary least squares (OLS). The estimation consisted of including those variables that *a priori* would explain variation in wildlife values. The explanatory variables in the analysis include (a) the substitute site, (b) the method, (c) the study origin, (d) consumptive hunting and fishing, (e) open-ended questions, (f) willingness to pay, and (g) data year. The results of the OLS regressions are shown in tables 5.1 and 5.2. These results reflect the use of non-consumptive wildlife activities as the base case. This case will allow for comparisons between consumptive and non-consumptive activities.

Table 5.1 documents the results of the linear OLS regression. The adjusted R-squared is 30%, indicating that 30% of the total variation in the reported values is explained by the variables in the functions. The significant variables are substitute site, hunting, and willingness to pay. The benefit value is in 1994 dollars; therefore, the significant variables can be interpreted in the following manner: If the individuals were asked about possible substitute sites, the benefit value was $22 less than if the question was not asked. A possible reason for such a result may be that when individuals are prompted to think about alternative sites, they might report a decreased wildlife value as more alternatives are identified. Hunting activities are positive, which indicates that hunters increase the wildlife values by $31 over and above non-consumptive wildlife activities. Willingness to pay is negative, which indicates that people will decrease the wildlife/recreational value by $79 if they are asked about their "willingness to pay" verses "willingness to accept" . Economic theory and practice have shown that such a result is accurate for the following reasons: (a) individuals' willingness to pay is bounded by income constraints, (b)

the "endowment effect", and (c) the fewer the substitutes, the larger the WTA value (Kahneman and Knetsch, 1992).

TABLE 5.1: RESULTS OF LINEAR OLS REGRESSION

Variable	Estimated Coefficient	P -Value	Alpha = .10 Adjusted R-Squared = .2984 Mean of Dependent Variable =75
SUB	-22*	0.027	
MET	-104	0.153	
COUV	-11	0.565	
HUNT	31*	0.041	
FISH	27	0.174	
OED	87	0.279	
WTP	-79*	0.019	
DYEAR	4	0.803	
CONSTANT	140*	0.001	

*Estimated coefficients are significant at the .10 level.

The second table, Table 5.2, shows the results of changing the functional form of the regression to log linear. Note that the goodness of fit (adjusted R-squared value) has increased to 40%. Furthermore, one additional variable (fishing) becomes significant at the .10 level. The effects of the significant variables on the wildlife and recreational benefit values are larger than the linear model. To derive the real effects of the explanatory variables on the wildlife benefit estimates, the estimated coefficients were multiplied by $75 (the mean value of the dependent variable). The estimated coefficient of substitute sites is again negative, indicating that individuals decrease the wildlife benefit estimates by $51 if asked such questions, verses if they were not asked at all. The coefficients for hunting and fishing are positive, resulting in wildlife values $105 and $96 higher, respectively, than the base case of non-consumptive wildlife activities. Finally,

the coefficient for WTP is again negative, indicating that individuals will decrease the wildlife benefit value by $45 if asked WTP questions verses WTA compensation questions.

TABLE 5.2: RESULTS OF LOG LINEAR OLS REGRESSION

Variable	Estimated Coefficient	P-Value	Alpha = .10 Adjusted R-squared = .4010 Mean of Log Dependent Variable = 4.0
SUB	-51*	0.04	
MET	-48	0.148	
COUV	6	0.967	
HUNT	105*	0.002	
FISH	96*	0.007	
OED	11	0.745	
WTP	-45*	0.019	
DYEAR	-18	0.253	
CONSTANT	281*	0	

*Estimated coefficients are significant at the .10 level

The linear and log linear OLS regressions resulted in noteworthy insignificant variables (country, data year, method, and open-ended questions). The country variable was included in the analysis to test if U.S. (Canadian) citizens value wildlife resources differently. The insignificance of the variable indicates that results of the studies completed in the United States are not significantly different than those reported in Canadian studies. One can speculate that participants in both countries value wildlife in a similar manner. This result supports the idea of information transfers between the United States and Canada.

A second interesting insignificant result is the data year variable. This variable was included in the analysis to represent improvements in the CVM and TCM techniques. The variable was to capture two possible scenarios: (a) that, over the years, the methods of non-market valuation have greatly improved, resulting in more "accurate" benefit values; or (b) as individuals become more aware of the destruction and scarcity of the wildlife habitat on both a local and global level, their valuation of activities such as hunting, fishing, camping, and hiking also increase. The insignificance of the data year reveals that, between 1970 and 1995, benefit values have more or less remained the same.

The third insignificant variable was valuation method. The results of the regressions show that benefit values derived from the TCM and CVM are not significantly different. This result is encouraging, in that refinements of the two valuation techniques have brought their results closer together.

The final insignificant results of the linear and log linear regressions concerned the open-ended questions. Economic studies such as that of Holmes and Kramer (1995) show that closed-ended questions elicit larger benefit values than open-ended questions. The higher closed-ended values arise because individuals feel morally motivated to increase the bid value, for saying "no" to the proposed bid will make them appear as if they do not value the non-market good or service in question. The results of this study, however, indicate that open-ended and closed-ended questions are not significantly different from each other. This could have arisen from the fact that most of the CVM studies included within this analysis (14 of 25) were open-ended in nature.

D. Implication of Results

The literature on benefit values for wildlife and environmental resources is growing rapidly, and summarizing it is becoming more difficult. The results of this research must be considered tentative and subject to change as more advances are made in this area, particularly with respect to the definition of other variables that may capture the variability of wildlife benefit values. Walsh *et al* (1989) identified some new explanatory variables that may be significant, such a payment vehicles, the monetary and time cost of travel, and site quality and uncertainty.

Even though these results must be considered tentative, they show that the consolidation of empirical studies can be done successfully, and with important implications. By its nature, meta-analysis exposes both knowledge gaps and known literature. Indeed, knowing what has been explored is as valuable as cleaning the direction for further research. The identification of knowledge gaps provides a means to allocate money and effort to those areas in need of research (to create a solid literature base) while avoiding instances of repetition.

These results also imply that as the literature base grows and becomes complete, it will provide a foundation upon which general conclusions can be drawn. Policy makers need to know what works "in general", and this is what can be tested by meta-analysis (Cook *et al*, 1992).

Finally, my thesis shows that questions both posed and not posed affect wildlife benefit values. In most cases, specific questions about such things as substitute sites prompt individuals

to consider a more accurate value of wildlife and recreation. Gaining an awareness of those questions that require the individual to provide a more "educated" value is beneficial on two accounts: first, more accurate wildlife and recreation values can influence the determination of proper compensation for human-made environmental disasters; and, second, policies such as benefit transfers that rely heavily on benefit valuations will reflect a more accurate societal demand for wildlife.

E. Conclusion

These results represent the first meta-analytic study to be done on predominately Canadian data (Rush, 1995). The research shows that combining literature on wildlife benefit estimation can provide generalized results. More specifically, the study proved that there is a systematic relationship between the wildlife benefit estimates and the features of the empirical study. The results of the thesis are tentative, for more research is needed in this area to strengthen this type of research. They can, however, provide a stepping stone for future meta-analysis in both the literature review and variable definition.

The model focused upon (a) the types of questions asked, (b) the valuation method, (c) the origin, (d) the data year, (e) the type of CVM questions, and (f) the focus of the study. The model, however, is not limited to these variables. Factors such as TCM specification, regional variables, and site quality could be used to broaden the score of the model.

Policy analysis on benefit transfers, which include (a) transferring per unit benefit estimates from an original site to a new application, and (b) creating an aggregate estimate for the relevant population from per unit benefit estimates (Smith *et al*, p.420, 1990), has been rapidly growing. The idea of applying past studies to future policy decisions has been fueled by budget constraints and increased demand for non-market valuation studies. One result from the thesis indicates that study results from the United States (Idaho and Maine) could be adopted in Canada. The model did not examine the impact of benefit values from different regions within

Canada, but one could speculate that the benefit values from different regions are not significantly different between regions. Ultimately, this could indicate that, in times of restricted budgets, sharing of information between regions and borders would be successful.

Perhaps a final area in which meta-analysis can be beneficial is in non-market valuation. The results of the study reveal that there are important variables that directly affect wildlife benefit values. Having a systematic approach to identify these variables can improve the quality of non-market valuation techniques (CVM and TCM). Ultimately, meta-analysis could serve as a valuation method due to its ability to clarify significant variables that affect wildlife benefit estimates.

CHAPTER VI RELEVANT WORK IN PROGRESS

A. Introduction

Currently, there is one related database in circulation and one other in the preliminary stages of research. ENVALUE is the first database in the world of reported environmental valuation estimates, comprised of over 250 overseas and Australian studies. The database includes studies on air, water, and land quality, noise and radiation, and natural areas. The authors of the database also critically assess the methodology of each study. The ENVALUE database can be run on an IBM compatible computer with Microsoft Windows 3.1 (Mark Morrison - E Mail). The cost of the ENVALUE package is $115 and can be purchased from NSW Government Information Service, Australia.

The second database, which is in the preliminary stages of research, is called the Environmental Valuation Reference Inventory (EVRI). This database will be created by the Economic Analysis Branch (Environment Canada) as well as a United States liaison. The EVRI database will contain studies from Canada, the United States as well as the rest of the world. For further information on the EVRI database and its' format, contact Paul De Civita at the Economic Analysis Branch, Environment Protection Service, Quebec.

CHAPTER VII SUMMARY AND CONCLUSIONS

The Canadian Wildlife Database is composed of 53 wildlife and recreational valuation studies. The database is the first of it's kind pertaining to Alberta and Canadian data. The advantages of summarizing, and consolidating past studies, provides a means in which policies (such as benefit transfers),and analysis (such as meta-analysis) can be accomplished. Perhaps, one other advantage of culminating vast data, is that knowledge gaps can be assessed. Case in point, this database is deficient in four main areas (quality changes, non-use valuations, expenditures, and capital cost issues), and by focusing on these selected areas will enable the database to become complete while avoiding repetition.

As more and more valuation studies are executed, there must be a means in which to organize the data. Valuation Databases are being created for this very reason. Ultimately, the flow of information between borders and oceans may occur as databases are shared. This flow of information may reduce the need to create and administer new valuation studies.

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APPENDIX A: USERS MANUAL

The following users manual provides a few key descriptions on accessing and updating the Canadian Wildlife Database. These outlining descriptions provide information on (a) accessing the database, (b) adding new fields to the database, (c) adjusting field widths, (d) the code sheet, (e) documentation, (f) list and form views, (g) maneuverability, (h) queries, (i) saving, and (j) updating the database. This list of key elements is in no way complete, and it does not substitute the knowledge gained from working with the database and becoming familiar with it's characteristics.

ACCESSING THE DATABASE

The database was created on Microsoft Works for windows 3.1. The database can be accessed by disk or from the hard drive.

(a) To access the wildlife database from the disk, activate MS works, and select "open an existing document".

(b) Click on the filename "WVDATA", and click on the "a" drive, press "ok".

(c) The database will appear in list view form.

(d) To access the database from the hard drive, simply activate "open an existing document", click on the filename WVDATA, and press "ok".

ADDING NEW FIELDS/COLUMNS

When adding studies into the database, one may require to add in new fields (columns) to the database. This is accomplished by:

(a) Move to the list view format (by accessing "list view" from the menu).

(b) Highlight the column that you would like to have as the new field.

(c) Click on "insert" and then on "field name".

(d) Name the field appropriately, and press "ok".

(e) To add the new field name to the form view, repeat the above steps in the form view format. Remember to click on the space that you would like for the new field name to appear.

ADJUSTING FIELD WIDTH

In form view, one can maneuver the field name by clicking on it and dragging it to a new location. The field width can be altered by clicking on "format" and then on "field width". In list view, the width of the fields can be changed by clicking on the edge of the field name cell and moving it to either the right or left.

CODE SHEETS

A hard copy of the code sheets will be supplied with the disk. When coding information, one has two options: to use the hard copy of the code sheets or, to use the code sheet equivalent supplied in the form view directly on the right. Both copies of the code sheets should be updated when necessary.

DOCUMENTATION

Once new studies are properly coded into the database, documentation of the title of the study, author, publisher, and date into the annotated bibliography will ensure easy reference in the future.

LIST AND FORM VIEW

The database has two structures, the list view and the form view. Both views allow for the addition of new information. To add studies into the list view, simply click on the new blank ID# cell and add the information into the corresponding row. To add studies into the form view, click on the line after the field name you want and add in the information. For each row in the list view provides the corresponding information in the form view. Simply click on any cell in list view, move to form view, and the corresponding information will appear (and vise versa).

MANEUVERABILITY

In the list view, one can move from cell to cell with the arrow keys on the key board. Moving throughout the database is made easier by using the arrow keys on the far right and bottom of the database screen. In form view, pressing enter or clicking on the lines after the field name will allow you to move from field to field.

QUERIES

Queries can be created (click on "tools" in the menu and on "create new query") in order to gather studies with common elements (*ie*, to gather all studies that focus on hunting or fishing). **Note**, after each query has been executed, click on "view" and "show all records" before proceeding to a new query.

SAVING

After adding in a new study, remember to save by either clicking on the "save" icon or by clicking on "file" and then "save".

UPDATING THE DATABASE

Information can be added in both the form view and the list view. Proper coding ensures accuracy. To delete information in list view, highlight the cell, and press "delete". To do the same in form view, highlight the line after the field name and press "delete".

APPENDIX B: ANNOTATED BIBLIOGRAPHY

ANNOTATED BIBLIOGRAPHY

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APPENDIX C: CODE SHEET AND SAMPLE OF DATABASE

WILDLIFE VALUE DATABASE
CODE SHEET

FOCUS OF STUDY OPTIONS

1. Recreational Hunting
2. Recreational Fishing
3. Bird Watching
4. Existence Values
5. Non Consumptive Sport Fishing & Wildlife Activities
6. Total Economic Value
7. Environmental Quality Change
8. Valuation of Fish & Wildlife Habitat
9. Aesthetic Value of Wildlife

SPECIES

1. Mountain Sheep
2. Moose
3. Grizzly Bear
4. Mountain Goat
5. Elk
6. Black Bear
7. Sport Fishing
8. Big Game Hunting
9. Upland Birds
10. Waterfowl
11. Caribou
12. All Migrating Birds
13. Deer
14. Upland Game
15. Antelope
16. Unspecified Hunting
17. Unspecified Fishing
18. All Wildlife
19. Pheasant
20. Cold Water Fishing
21. Warm Water Fishing
22. Bird Game (9+10)
23. Bass
24. Recreational Activities
25. Cougar
26. Wolf

GEOGRAPHICAL INFORMATION

1. Country
2. Province/State
3. Region
4. Country
5. Zone
6. Wildlife Management Unit
7. Other

WILDLIFE VALUE DATABASE
CODE SHEET

CONTINGENT VALUATION

0. N/A
1. Open Ended
2. Closed Ended

WILLINGNESS TO PAY

0. N/A
1. Applicable

WILLINGNESS TO ACCEPT

0. N/A
1. Applicable

TRAVEL COST MODEL

0. N/A
1. Traditional Travel Cost Model
2. Random Utility Model

HEDONIC MODEL

0. N/A
1. Applicable

BENEFICIARIES

1. Regional
2. Provincial Residence
3. Canadians
4. Non-Canadians
5. Non-Residence

WILDLIFE VALUE DATABASE
CODE SHEET

DENOMINATOR VALUE

1. Per Recreational Experience
2. Per Person/Hour
3. Per Person/Hunter Day
4. Per Person/Trip
5. Per Group/Year
6. Lump Sum Quality Change
7. Per Person/Season/Year
8. Per Acre
9. Per Province/Year

SURVEY CHARACTERISTICS (ALL FIELDS)

0. Not Included
1. Included

N/A. Survey was Unavailable

TYPE OF SURVEY USED

1. In Person
2. Telephone
3. Mailing Questionnaire

CAPITAL COSTS/GOODS

0. Not Fully Specified/Not Included
1. Vehicle
2. Rifles & Ammunition
3. Camping Gear
4. Binoculars
5. General Equipment
6. Rental Costs
7. Camera & Film

VARIABLE COST (VALUES)

N/A. Information was Missing

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
1	#1	1	Adamowicz. W.L.
2	#1	1	Adamowicz. W.L.
3	#1	1	Adamowicz. W.L.
4	#1	1	Adamowicz. W.L.
5	#1	1	Adamowicz. W.L.
6	#1	1	Adamowicz. W.L.
7	#1	1	Adamowicz. W.L.
8	#1	1	Adamowicz. W.L.
9	#1	1	Adamowicz. W.L.
10	#1	1	Adamowicz. W.L.
11	#2	2	Miller. R.J.
12	#2	1	Miller. R.J.
13	#3	1	Pattison. W.S.
14	#3	1	Pattison. W.S.
15	#4	1	Wilson. W.R.
16	#4	1	Wilson. W.R.
17	#4	1	Wilson. W.R.
18	#5	4	Tanguay. M.R.
19	#5	4	Tanguay. M.R.
20	#6	3	Hvenegaard. G.T., Butler. J.R., Krystofiak. D.K.
21	#7	1	Condon. B.S.
22	#8	1	Sorg. C.F., Nelson. L.J.
23	#8	1	Sorg. C.F., Nelson. L.J.
24	#9	1	Donnelly. D.M., Nelson. L.J.
25	#10	1	Sorg. C.F., Nelson. L.J.
26	#10	1	Sorg. C.F., Nelson. L.J.
27	#11	1	Young.J.S., Donnelly. D.M., Sorg. C.F., Loomis. J.B., Nelson. L.J.
28	#11	1	Young.J.S., Donnelly. D.M., Sorg. C.F., Loomis. J.B., Nelson. L.J.
29	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
30	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
31	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
32	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
33	#13	5	Phillips. W., DePape. D., Ewanyk. L.
34	#13	5	Phillips. W., DePape. D., Ewanyk. L.
35	#14	4	Asafu-Adjaye. J.

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
1	1983	2	2	104	1981	1	1	0
2	1983	3	2	174	1981	1	1	0
3	1983	4	2	N/A	1981	1	1	0
4	1983	5	2	112	1981	1	1	0
5	1983	6	2	55	1981	1	1	0
6	1983	2	2	104	1981	1	0	1
7	1983	3	2	174	1981	1	0	1
8	1983	4	2	N/A	1981	1	0	1
9	1983	5	2	112	1981	1	0	1
10	1983	6	2	55	1981	1	0	1
11	1971	7	2	N/A	1968	1	1	0
12	1971	8	2	N/A	1968	1	1	0
13	1970	2	5	415	1968	1	1	0
14	1970	2	5	415	1968	1	1	0
15	1983	9	2	167	1976	1	1	0
16	1983	10	2	323	1976	1	1	0
17	1983	8	2	299	1976	1	1	0
18	1994	11	2	908	1992	1	1	0
19	1994	11	2	1074	1992	1	1	0
20	1989	12	5	603	1987	1	1	0
21	1993	2	2	1255	1992	1	1	0
22	1986	5	2	1629	1983	1	1	0
23	1986	5	2	1629	1983	0	1	0
24	1986	13	2	1445	1982	0	1	0
25	1987	10	2	1479	1982	0	1	0
26	1987	10	2	1479	1982	1	0	0
27	1987	14	2	1479	1982	0	1	0
28	1987	14	2	1479	1982	1	1	0
29	1985	4	2	census	1982	0	1	0
30	1985	1	2	census	1982	0	1	0
31	1985	2	2	census	1982	0	1	0
32	1985	15	2	census	1982	0	1	0
33	1977	24	3	410	1976	1	1	0
34	1977	24	3	689	1976	1	1	0
35	1989	3	2	2590	1987	2	1	0

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
1	0	0	N/A	2	$72.00	$126
2	0	0	N/A	2	$70.00	$123
3	0	0	N/A	2	$68.00	$119
4	0	0	N/A	2	$63.00	$111
5	0	0	N/A	2	$53.00	$93
6	0	0	N/A	2	$55.00	$96
7	0	0	N/A	2	$107.00	$188
8	0	0	N/A	2	$52.00	$91
9	0	0	N/A	2	$67.00	$118
10	0	0	N/A	2	$81.00	$142
11	0	0	N/A	2	$7.00	$33
12	0	0	N/A	2	$9.00	$43
13	0	0	N/A	2	$4.00	$19
14	0	0	N/A	4	$12.00	$57
15	0	0	N/A	2	$4.00	$11
16	0	0	N/A	2	$4.00	$11
17	0	0	N/A	2	$7.00	$19
18	0	0	N/A	2	$14.00	$15
19	0	0	N/A	2	$30.00	$31
20	0	0	N/A	1	$256.00	$342
21	0	0	N/A	2	$123.00	$127
22	0	0	N/A	4	$92.00	$137
23	1	0	N/A	4	$99.00	$148
24	1	0	N/A	4	$50.00	$77
25	1	0	N/A	4	$22.00	$34
26	0	0	N/A	4	$17.00	$26
27	1	0	N/A	4	$35.00	$54
28	0	0	N/A	4	$26.00	$40
29	1	0	N/A	4	$90.00	$138
30	1	0	N/A	4	$28.00	$43
31	1	0	N/A	4	$19.00	$29
32	1	0	N.A	4	$38.00	$58
33	0	0	N/A	1	$4.00	$11
34	0	0	N/A	2	$3.00	$8
35	0	0	N/A	2	$45.00	$57

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
1	3	1	1	1	1	1	1
2	3	1	1	1	1	1	1
3	3	1	1	1	1	1	1
4	3	1	1	1	1	1	1
5	3	1	1	1	1	1	1
6	3	1	1	1	1	1	1
7	3	1	1	1	1	1	1
8	3	1	1	1	1	1	1
9	3	1	1	1	1	1	1
10	3	1	1	1	1	1	1
11	3	1	1	1	1	1	1
12	3	1	1	1	1	1	1
13	3	1	1	1	1	1	1
14	3	1	1	1	1	1	1
15	3	1	1	1	1	1	0
16	3	1	1	1	1	1	0
17	3	1	1	1	1	1	0
18	7	1	0	0	0	0	0
19	7	1	0	0	0	0	0
20	4	1	1	1	1	1	0
21	7	1	1	1	1	1	1
22	4	0	1	1	1	1	1
23	4	0	1	1	1	1	1
24	4	0	1	1	1	1	1
25	4	0	1	1	1	0	1
26	4	0	1	1	1	0	1
27	4	0	1	1	1	1	1
28	4	0	1	1	1	1	1
29	3	0	0	0	0	0	0
30	3	0	0	0	0	0	0
31	3	0	0	0	0	0	0
32	3	0	0	0	0	0	0
33	3	1	0	0	1	1	1
34	3	1	0	0	0	1	1
35	7	1	1	1	1	1	1

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
1	0	1	1	3	N/A	$20/yr	$76/yr	$179/yr
2	0	1	1	3	N/A	$14/yr	$72/yr	$146/yr
3	0	1	1	3	N/A	$97/yr	$313/yr	$652/yr
4	0	1	1	3	N/A	$18/yr	$84/yr	$200/yr
5	0	1	1	3	N/A	$8/yr	$39/yr	$103/yr
6	0	1	1	3	N/A	$20/yr	$76/yr	$179/yr
7	0	1	1	3	N/A	$14/yr	$72/yr	$146/yr
8	0	1	1	3	N/A	$97/yr	$313/yr	$652/yr
9	0	1	1	3	N/A	$18/yr	$84/yr	$200/yr
10	0	1	1	3	N/A	$8/yr	$39/yr	$103/yr
11	0	1	0	3	$3	$9/yr	N/A	$73/yr
12	0	1	0	3	$3-$8	$4/yr	N/A	$25/yr
13	1	1	0	3	$6	$13/tr	$40/tr	$43/tr
14	1	1	0	3	$6	N/A	N/A	N/A
15	0	1	1	3	$7	N/A	N/A	N/A
16	0	1	1	3	$7	N/A	N/A	N/A
17	0	1	1	3	$7	N/A	N/A	N/A
18	0	1	0	3	N/A	N/A	N/A	N/A
19	0	1	0	3	N/A	N/A	N/A	N/A
20	0	1	0	1	N/A	N/A	N/A	N/A
21	0	1	1	3	N/A	N/A	N/A	N/A
22	1	0	0	2	N/A	$86/tr	$84/tr	$92/tr
23	1	0	0	2	N/A	$86/tr	$84/tr	$92/tr
24	1	0	0	3	N/A	N/A	N/A	N/A
25	0	0	0	2	N/A	N/A	N/A	N/A
26	0	0	0	2	N/A	$39/tr	$8/tr	$30/tr
27	0	0	0	2	N/A	N/A	N/A	N/A
28	0	0	0	2	N/A	$2/day	$10/day	$12/day
29	0	0	0	0	$71	N/A	N/A	N/A
30	0	0	0	0	$71	N/A	N/A	N/A
31	0	0	0	0	$71	N/A	N/A	N/A
32	0	0	0	0	$71	N/A	N/A	N/A
33	1	1	0	1	N/A	N/A	N/A	N/A
34	1	1	0	3	N/A	N/A	N/A	N/A
35	0	1	0	3	N/A	N/A	N/A	N/A

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
1	$23/yr	2	$26/yr	$376/yr	$561/yr
2	$44/yr	2	$24/yr	$431/yr	$643/yr
3	$170/yr	2	$63/yr	$1889/yr	$2819/yr
4	$33/yr	2	$29/yr	$429/yr	$640/yr
5	$6/yr	2	$11/yr	$217/yr	$324/yr
6	$23/yr	2	$26/yr	$376/yr	$561/yr
7	$44/yr	2	$24/yr	$431/yr	$643/yr
8	$170/yr	2	$63/yr	$1889/yr	$2819/yr
9	$33/yr	2	$29/yr	$429/yr	$640/yr
10	$6/yr	2	$11/yr	$217/yr	$324/yr
11	$17/yr	5	$19/yr	N/A	N/A
12	$10/yr	2	$15/yr	$69/yr	$283/yr
13	$18/tr	3	$3/tr	$239/yr	$1039/yr
14	N/A	0	N/A	N/A	N/A
15	N/A	0	N/A	N/A	N/A
16	N/A	0	N/A	N/A	N/A
17	N/A	0	N/A	N/A	N/A
18	N/A	0	N/A	N/A	N/A
19	N/A	0	N/A	N/A	N/A
20	N/A	0	N/A	$224/tr	$257/tr
21	N/A	0	N/A	N/A	N/A
22	N/A	0	N/A	N/A	N/A
23	N/A	0	N/A	N/A	N/A
24	N/A	0	N/A	N/A	N/A
25	N/A	0	N/A	N/A	N/A
26	N/A	2	$8/tr	$39/tr	$51/tr
27	N/A	0	N/A	N/A	N/A
28	N/A	2	$10/day	N/A	N/A
29	N/A	0	N/A	N/A	N/A
30	N/A	0	N/A	N/A	N/A
31	N/A	0	N/A	N/A	N/A
32	N/A	0	N/A	N/A	N/A
33	N/A	0	N/A	N/A	N/A
34	N/A	0	N/A	N/A	N/A
35	N/A	0	N/A	N/A	N/A

VALUE OF WILDLIFE IN ALBERTA

TECHNICAL APPENDIX

BY

BONNIE C. RUSH

FOR

WILDLIFE MANAGEMENT DIVISION

ALBERTA ENVIRONMENTAL PROTECTION

DEPARTMENT OF RURAL ECONOMY

NOVEMBER 1995

CODE SHEETS

WILDLIFE VALUE DATABASE
CODE SHEET

FOCUS OF STUDY OPTIONS

1. Recreational Hunting
2. Recreational Fishing
3. Bird Watching
4. Existence Values
5. Non Consumptive Sport Fishing & Wildlife Activities
6. Total Economic Value
7. Environmental Quality Change
8. Valuation of Fish & Wildlife Habitat
9. Aesthetic Value of Wildlife

SPECIES

1. Mountain Sheep
2. Moose
3. Grizzly Bear
4. Mountain Goat
5. Elk
6. Black Bear
7. Sport Fishing
8. Big Game Hunting
9. Upland Birds
10. Waterfowl
11. Caribou
12. All Migrating Birds
13. Deer
14. Upland Game
15. Antelope
16. Unspecified Hunting
17. Unspecified Fishing
18. All Wildlife
19. Pheasant
20. Cold Water Fishing
21. Warm Water Fishing
22. Bird Game (9+10)
23. Bass
24. Recreational Activities
25. Cougar
26. Wolf

GEOGRAPHICAL INFORMATION

1. Country
2. Province/State
3. Region
4. Country
5. Zone
6. Wildlife Management Unit
7. Other

WILDLIFE VALUE DATABASE
CODE SHEET

CONTINGENT VALUATION

0. N/A
1. Open Ended
2. Closed Ended

WILLINGNESS TO PAY

0. N/A
1. Applicable

WILLINGNESS TO ACCEPT

0. N/A
1. Applicable

TRAVEL COST MODEL

0. N/A
1. Traditional Travel Cost Model
2. Random Utility Model

HEDONIC MODEL

0. N/A
1. Applicable

BENEFICIARIES

1. Regional
2. Provincial Residence
3. Canadians
4. Non-Canadians
5. Non-Residence

WILDLIFE VALUE DATABASE
CODE SHEET

DENOMINATOR VALUE

1. Per Recreational Experience
2. Per Person/Hour
3. Per Person/Hunter Day
4. Per Person/Trip
5. Per Group/Year
6. Lump Sum Quality Change
7. Per Person/Season/Year
8. Per Acre
9. Per Province/Year

SURVEY CHARACTERISTICS (ALL FIELDS)

0. Not Included
1. Included

N/A. Survey was Unavailable

TYPE OF SURVEY USED

1. In Person
2. Telephone
3. Mailing Questionnaire

CAPITAL COSTS/GOODS

0. Not Fully Specified/Not Included
1. Vehicle
2. Rifles & Ammunition
3. Camping Gear
4. Binoculars
5. General Equipment
6. Rental Costs
7. Camera & Film

VARIABLE COST (VALUES)

N/A. Information was Missing

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DATABASE

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
1	#1	1	Adamowicz. W.L.
2	#1	1	Adamowicz. W.L.
3	#1	1	Adamowicz. W.L.
4	#1	1	Adamowicz. W.L.
5	#1	1	Adamowicz. W.L.
6	#1	1	Adamowicz. W.L.
7	#1	1	Adamowicz. W.L.
8	#1	1	Adamowicz. W.L.
9	#1	1	Adamowicz. W.L.
10	#1	1	Adamowicz. W.L.
11	#2	2	Miller. R.J.
12	#2	1	Miller. R.J.
13	#3	1	Pattison. W.S.
14	#3	1	Pattison. W.S.
15	#4	1	Wilson. W.R.
16	#4	1	Wilson. W.R.
17	#4	1	Wilson. W.R.
18	#5	4	Tanguay. M.R.
19	#5	4	Tanguay. M.R.
20	#6	3	Hvenegaard. G.T., Butler. J.R., Krystofiak. D.K.
21	#7	1	Condon. B.S.
22	#8	1	Sorg. C.F., Nelson. L.J.
23	#8	1	Sorg. C.F., Nelson. L.J.
24	#9	1	Donnelly. D.M., Nelson. L.J.
25	#10	1	Sorg. C.F., Nelson. L.J.
26	#10	1	Sorg. C.F., Nelson. L.J.
27	#11	1	Young.J.S., Donnelly. D.M., Sorg. C.F., Loomis. J.B., Nelson. L.J.
28	#11	1	Young.J.S., Donnelly. D.M., Sorg. C.F., Loomis. J.B., Nelson. L.J.
29	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
30	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
31	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
32	#12	1	Loomis. J.B., Donnell. D.M., Sorg. C.F., Oldenburg. L.
33	#13	5	Phillips. W., DePape. D., Ewanyk. L.
34	#13	5	Phillips. W., DePape. D., Ewanyk. L.
35	#14	4	Asafu-Adjaye. J.

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
36	#14	4	Asafu-Adjaye. J.
37	#14	6	Asafu-Adjaye. J.
38	#14	6	Asafu-Adjaye. J.
39	#15	8	Macnab. B., Brusnyk. L.
40	#15	8	Macnab. B., Brusnyk. L.
41	#16	7	Morton. K.M.
42	#16	7	Morton. K.M.
43	#17	1	Phillips. W., DePape. D., Ewanyk. L.
44	#17	1	Phillips. W., DePape. D., Ewanyk. L.
45	#17	1	Phillips. W., DePape. D., Ewanyk. L.
46	#17	1	Phillips. W., DePape. D., Ewanyk. L.
47	#17	1	Phillips. W., DePape. D., Ewanyk. L.
48	#17	1	Phillips. W., DePape. D., Ewanyk. L.
49	#17	1	Phillips. W., DePape. D., Ewanyk. L.
50	#17	1	Phillips. W., DePape. D., Ewanyk. L.
51	#17	1	Phillips. W., DePape. D., Ewanyk. L.
52	#18	1	Adamowicz. W.L., Phillips. W.E., Pattison. W.S.
53	#18	1	Adamowicz. W.L., Phillips. W.E., Pattison. W.S.
54	#19	9	Pope III. C.A., Adams. C.E., Thomas. J.K.
55	#20	2	Phillips. W.E., McElhaney
56	#21	2	Phillips. W.E., DePape. D., Ewanyk. L.
57	#21	2	Phillips. W.E., DePape. D., Ewanyk. L.
58	#22	1	Bodden. K., Lee. P.
59	#22	1	Bodden. K., Lee. P.
60	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
61	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
62	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
63	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
64	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
65	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
66	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
67	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
68	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
69	#23	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
70	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
71	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
72	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
73	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
74	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
75	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
76	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
77	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
78	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
79	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
80	#24	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E.
81	#25	2	Boyle,K.J., Trefts, V.A., Hesketh, P.S.
82	#25	1	Boyle,K.J., Trefts, V.A., Hesketh, P.S.
83	#25	4	Boyle,K.J., Trefts, V.A., Hesketh, P.S.
84	#26	1	Duffield, J., Neher, C.
85	#27	1	Duffield, J., Neher, C.
86	#27	1	Duffield, J., Neher, C.
87	#28	1	Prather, R.A.
88	#28	1	Prather, R.A.
89	#28	1	Prather, R.A.
90	#28	1	Prather, R.A.
91	#28	1	Prather, R.A.
92	#28	1	Prather, R.A.
93	#29	5	Boxall, P.C., Stelfox, H.A., Hvenegaard, G.T.
94	#29	5	Boxall, P.C., Stelfox, H.A., Hvenegaard, G.T.
95	#30	1	Ministry of Forests, Recreation Branch
96	#30	2	Ministry of Forests, Recreation Branch
97	#30	4	Ministry of Forests, Recreation Branch
98	#30	5	Ministry of Forests, Recreation Branch
99	#31	5	Thompson, J.P., Sen, A.R., Scace, R.C.
100	#31	5	Thompson, J.P., Sen, A.R., Scace, R.C.
101	#32	4	Thompson, J.P., Sen, A.R., Scace, R.C.
102	#32	5	Thompson, J.P., Sen, A.R., Scace, R.C.
103	#33	2	Thompson, J.P., Sen, A.R., Scace, R.C.
104	#34	1	Swanson, C.S., Thomas, M., Donnelly, D.M.
105	#34	1	Swanson, C.S., Thomas, M., Donnelly, D.M.

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
106	#34	1	Swanson, C.S., Thomas, M., Donnelly, D.M.
107	#34	1	Swanson, C.S., Thomas, M., Donnelly, D.M.
108	#34	1	Swanson, C.S., Thomas, M., Donnelly, D.M.
109	#34	1	Swanson, C.S., Thomas, M., Donnelly, D.M.
110	#35	2	Alberta Forestry, Lands & Wildlife
111	#36	2	Sorg, C.F., Loomis, J.B., Donnelly, D.M., Peterson, G.J., Nelson, L.J.
112	#36	2	Sorg, C.F., Loomis, J.B., Donnelly, D.M., Peterson, G.J., Nelson, L.J.
113	#36	2	Sorg, C.F., Loomis, J.B., Donnelly, D.M., Peterson, G.J., Nelson, L.J.
114	#36	2	Sorg, C.F., Loomis, J.B., Donnelly, D.M., Peterson, G.J., Nelson, L.J.
115	#37	1	Asafu-Adjaye, J.
116	#38	2	Menz, F.C., Wilton, D.P.
117	#38	2	Menz, F.C., Wilton, D.P.
118	#38	2	Menz, F.C., Wilton, D.P.
119	#38	2	Menz, F.C., Wilton, D.P.
120	#38	2	Menz, F.C., Wilton, D.P.
121	#38	2	Menz, F.C., Wilton, D.P.
122	#38	2	Menz, F.C., Wilton, D.P.
123	#38	2	Menz, F.C., Wilton, D.P.
124	#38	2	Menz, F.C., Wilton, D.P.
125	#38	2	Menz, F.C., Wilton, D.P.
126	#38	2	Menz, F.C., Wilton, D.P.
127	#38	2	Menz, F.C., Wilton, D.P.
128	#38	2	Menz, F.C., Wilton, D.P.
129	#38	2	Menz, F.C., Wilton, D.P.
130	#38	2	Menz, F.C., Wilton, D.P.
131	#39	4	Walsh, R.G., Loomis, J.B., Gillman, R.A.
132	#40	4	Brookshire, D.S., Eubanks, L.S., Randall, A.
133	#40	4	Brookshire, D.S., Eubanks, L.S., Randall, A.
134	#41	5	Wilman, E.A., Perras, J.
135	#42	2	English, W.G., Yanosik, L.
136	#43	5	Development Planning Branch, Water Resources Division
137	#43	5	Development Planning Branch, Water Resources Division
138	#43	5	Development Planning Branch, Water Resources Division
139	#44	5	Phillips, W.E., Carroll, M.R.
140	#45	1	Reid, R.

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
141	#45	1	Reid, R.
142	#45	1	Reid, R.
143	#45	1	Reid, R.
144	#45	1	Reid, R.
145	#45	1	Reid, R.
146	#45	1	Reid, R.
147	#45	1	Reid, R.
148	#45	1	Reid, R.
149	#45	1	Reid, R.
150	#45	1	Reid, R.
151	#46	1	Reid, R.
152	#46	1	Reid, R.
153	#46	1	Reid, R.
154	#46	1	Reid, R.
155	#46	1	Reid, R.
156	#46	1	Reid, R.
157	#46	1	Reid, R.
158	#46	1	Reid, R.
159	#46	1	Reid, R.
160	#47	5	Rollins, K., Wistowsky, W.
161	#47	5	Rollins, K., Wistowsky, W.
162	#47	5	Rollins, K., Wistowsky, W.
163	#48	4	Reid, R., Stone, M.
164	#48	5	Reid, R., Stone, M.
165	#48	5	Reid, R., Stone, M.
166	#49	5	Boxall, P., McFarlane, B., Gartrell, M.
167	#50	5	Valla, A.
168	#51	2	Legg, D.
169	#51	2	Legg, D.
170	#52	1	Boxall, P.
171	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
172	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
173	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
174	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
175	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,

	ID NUMBER	FOCUS OF STUDY	AUTHOR(S)
176	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
177	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
178	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
179	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
180	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
181	#53	6	Filion. F.L., Jacquemot. A., Boxall. P., Reid. P., Bouchard. P., DuWors. E., Gray, P.A. Bath,
182	#54		

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
1	1983	2	2	104	1981	1	1	0
2	1983	3	2	174	1981	1	1	0
3	1983	4	2	N/A	1981	1	1	0
4	1983	5	2	112	1981	1	1	0
5	1983	6	2	55	1981	1	0	1
6	1983	2	2	104	1981	1	0	1
7	1983	3	2	174	1981	1	0	1
8	1983	4	2	N/A	1981	1	0	1
9	1983	5	2	112	1981	1	0	1
10	1983	6	2	55	1981	1	0	1
11	1971	7	2	N/A	1968	1	1	0
12	1971	8	2	N/A	1968	1	1	0
13	1970	2	5	415	1968	1	1	0
14	1970	2	5	415	1968	1	1	0
15	1983	9	2	167	1976	1	1	0
16	1983	10	2	323	1976	1	1	0
17	1983	8	2	299	1976	1	1	0
18	1994	11	2	908	1992	1	1	0
19	1994	11	2	1074	1992	1	1	0
20	1989	12	5	603	1987	1	1	0
21	1993	2	2	1255	1992	1	1	0
22	1986	5	2	1629	1983	0	1	0
23	1986	5	2	1629	1983	0	1	0
24	1986	13	2	1445	1982	0	1	0
25	1987	10	2	1479	1982	1	0	0
26	1987	10	2	1479	1982	0	1	0
27	1987	14	2	1479	1982	1	1	0
28	1987	14	2	1479	1982	0	1	0
29	1985	4	2	census	1982	0	1	0
30	1985	1	2	census	1982	0	1	0
31	1985	2	2	census	1982	0	1	0
32	1985	15	2	census	1982	0	1	0
33	1977	24	3	410	1976	1	1	0
34	1977	24	3	689	1976	1	1	0
35	1989	3	2	2590	1987	2	1	0

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
36	1989	8	2	2590	1987	2	1	0
37	1989	3	2	2590	1987	2	1	0
38	1989	8	2	2590	1987	2	1	0
39	1993	16	2	2170	1991	2	1	0
40	1993	17	2	611	1991	2	1	0
41	1993	13	2	1577	1992	0	1	0
42	1993	2	2	1526	1992	0	1	0
43	1977	8	6	680	1976	1	1	0
44	1977	9	6	680	1976	1	1	0
45	1977	10	6	680	1976	1	1	0
46	1977	16	6	680	1976	1	1	0
47	1977	8	3	398	1976	1	1	0
48	1977	9	3	398	1976	1	1	0
49	1977	10	3	398	1976	1	1	0
50	1977	16	3	398	1976	1	1	0
51	1977	16	3	398	1976	1	0	1
52	1986	10	3	N/A	1977	1	1	0
53	1986	10	3	N/A	1977	1	1	0
54	1984	18	2	3081	1982	0	0	0
55	1977	7	2	346	1976	1	1	0
56	1977	7	2	1836	1976	1	1	0
57	1977	7	3	1867	1976	1	1	0
58	1986	19	2	301	1985	1	1	0
59	1986	19	2	301	1985	0	1	0
60	1981	18	2	75119	1981	1	1	0
61	1981	18	2	5072	1981	1	1	0
62	1981	18	2	1930	1981	1	1	0
63	1981	18	2	5888	1981	1	1	0
64	1981	18	2	6303	1981	1	1	0
65	1981	18	2	12718	1981	1	1	0
66	1981	18	2	6623	1981	1	1	0
67	1981	18	2	7119	1981	1	1	0
68	1981	18	2	8049	1981	1	1	0
69	1981	18	2	6674	1981	1	1	0
70	1987	18	2	55173	1987	1	1	0

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
71	1987	18	2	census	1987	1	1	0
72	1987	18	2	census	1987	1	1	0
73	1987	18	2	census	1987	1	1	0
74	1987	18	2	census	1987	1	1	0
75	1987	18	2	census	1987	1	1	0
76	1987	18	2	census	1987	1	1	0
77	1987	18	2	census	1987	1	1	0
78	1987	18	2	census	1987	1	1	0
79	1987	18	2	census	1987	1	1	0
80	1987	18	2	census	1987	1	1	0
81	1988	7	2	214500	1980	1	1	0
82	1988	8	2	174100	1980	1	1	0
83	1988	18	2	818800	1980	1	1	0
84	1990	13	2	3328	1988	1	1	0
85	1991	10	2	487	1989	1	1	0
86	1991	10	2	129	1989	1	1	0
87	1974	8	2	1186	1969	1	1	0
88	1974	8	2	127	1969	1	1	0
89	1974	8	2	1310	1969	0	0	0
90	1974	8	2	148	1969	0	0	0
91	1974	8	2	1537	1969	0	0	0
92	1974	8	2	159	1969	0	0	0
93	1991	12	5	1172	1988	1	1	0
94	1991	12	5	110	1988	1	1	0
95	1991	16	2	5325	1989	1	1	0
96	1991	17	2	5325	1989	1	1	0
97	1991	18	2	5325	1989	1	1	0
98	1991	18	2	5325	1989	1	1	0
99	1987	18	3	1278	1986	1	1	0
100	1987	18	3	139	1987	1	1	0
101	1987	18	3	435	1986	1	1	0
102	1987	18	3	435	1986	1	1	0
103	1987	17	3	970	1986	1	1	0
104	1989	13	2	1819	1985	0	1	0
105	1989	4	2	360	1985	0	1	0

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
106	1989	2	2	581	1985	0	1	0
107	1989	13	2	1819	1985	0	1	0
108	1989	4	2	360	1985	0	1	0
109	1989	2	2	581	1985	0	1	0
110	1986	17	2	2945	1986	1	1	0
111	1985	20	2	1758	1982	1	1	0
112	1985	20	2	1758	1982	0	1	0
113	1985	21	2	1758	1982	1	1	0
114	1985	21	2	1758	1982	0	1	0
115	1986	22	2	78	1975	0	1	0
116	1983	23	4	904	1976	0	1	0
117	1983	23	4	904	1976	0	1	0
118	1983	23	4	904	1976	0	1	0
119	1983	23	4	904	1976	0	1	0
120	1983	23	4	904	1976	0	1	0
121	1983	23	4	904	1976	0	1	0
122	1983	23	4	904	1976	0	1	0
123	1983	23	4	904	1976	0	1	0
124	1983	23	4	904	1976	0	1	0
125	1983	23	4	904	1976	0	1	0
126	1983	23	4	904	1976	0	1	0
127	1983	23	4	904	1976	0	1	0
128	1983	23	4	904	1976	0	1	0
129	1983	23	4	904	1976	0	1	0
130	1983	23	4	904	1976	0	1	0
131	1984	18	2	218	1980	2	1	0
132	1983	3	2	2100	1982	1	1	0
133	1983	1	2	2100	1982	1	1	0
134	1987	24	2	N/A	1985	0	1	0
135	1984	17	3	143	1979	1	1	0
136	1970	24	5	N/A	1969	1	1	0
137	1970	24	5	N/A	1969	1	1	0
138	1970	24	5	N/A	1969	1	1	0
139	1978	18	2	N/A	1977	1	1	0
140	1985	6	2	11890	1981	1	1	0

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
141	1985	11	2	11890	1981	1	1	0
142	1985	25	2	11890	1981	1	1	0
143	1985	13	2	11890	1981	1	1	0
144	1985	5	2	11890	1981	1	1	0
145	1985	3	2	11890	1981	1	1	0
146	1985	2	2	11890	1981	1	1	0
147	1985	4	2	11890	1981	1	1	0
148	1985	1	2	11890	1981	1	1	0
149	1985	9	2	11890	1981	1	1	0
150	1985	10	2	11890	1981	1	1	0
151	1985	6	2	522	1981	1	1	0
152	1985	11	2	144	1981	1	1	0
153	1985	13	2	245	1981	1	1	0
154	1985	5	2	266	1981	1	1	0
155	1985	3	2	266	1981	1	1	0
156	1985	2	2	1014	1981	1	1	0
157	1985	4	2	219	1981	1	1	0
158	1985	1	2	181	1981	1	1	0
159	1985	26	2	148	1981	1	1	0
160	1994	24	3	2400	1993	1	1	0
161	1994	24	3	2400	1993	1	1	0
162	1994	24	3	2400	1993	1	1	0
163	1994	18	2	1561	1993	1	1	0
164	1994	24	2	1561	1993	2	1	0
165	1994	24	2	1561	1993	1	1	0
166	1995	24	3	13997	1994	0	1	0
167	1994	24	3	1322	1993	0	1	0
168	1993	17	2	12800	1990	1	1	0
169	1993	17	2	12800	1990	1	1	0
170	1995	15	2	N/A	1986	0	0	0
171	1994	18	2	103000	1991	1	1	0
172	1994	18	2	103000	1991	1	1	0
173	1994	18	2	103000	1991	1	1	0
174	1994	18	2	103000	1991	1	1	0
175	1994	18	2	103000	1991	1	1	0

	DATE PUBLISHED	SPECIES	GEOGRAPHY	SAMPLE SIZE	DATA YEAR	C.V.	W.T.P.	W.T.A.
176	1994	18	2	103000	1991	1	1	0
177	1994	18	2	103000	1991	1	1	0
178	1994	18	2	103000	1991	1	1	0
179	1994	18	2	103000	1991	1	1	0
180	1994	18	2	103000	1991	1	1	0
181	1994	18	2	103000	1991	1	1	0

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
1	0	0	N/A	2	$72.00	$126
2	0	0	N/A	2	$70.00	$123
3	0	0	N/A	2	$68.00	$119
4	0	0	N/A	2	$63.00	$111
5	0	0	N/A	2	$53.00	$93
6	0	0	N/A	2	$55.00	$96
7	0	0	N/A	2	$107.00	$188
8	0	0	N/A	2	$52.00	$91
9	0	0	N/A	2	$67.00	$118
10	0	0	N/A	2	$81.00	$142
11	0	0	N/A	2	$7.00	$33
12	0	0	N/A	2	$9.00	$43
13	0	0	N/A	2	$4.00	$19
14	0	0	N/A	4	$12.00	$57
15	0	0	N/A	2	$4.00	$11
16	0	0	N/A	2	$4.00	$11
17	0	0	N/A	2	$7.00	$19
18	0	0	N/A	2	$14.00	$15
19	0	0	N/A	2	$30.00	$31
20	0	0	N/A	1	$256.00	$342
21	0	0	N/A	2	$123.00	$127
22	0	0	N/A	4	$92.00	$137
23	1	0	N/A	4	$99.00	$148
24	1	0	N/A	4	$50.00	$77
25	1	0	N/A	4	$22.00	$34
26	0	0	N/A	4	$17.00	$26
27	1	0	N/A	4	$35.00	$54
28	0	0	N/A	4	$26.00	$40
29	1	0	N/A	4	$90.00	$138
30	1	0	N/A	4	$28.00	$43
31	1	0	N/A	4	$19.00	$29
32	1	0	N.A	4	$38.00	$58
33	0	0	N/A	1	$4.00	$11
34	0	0	N/A	2	$3.00	$8
35	0	0	N/A	2	$45.00	$57

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
36	0	0	N/A	2	$71.00	$90
37	0	0	N/A	2	$193.00	$244
38	0	0	N/A	2	$275.00	$348
39	0	0	N/A	2	$96.00	$100
40	0	0	N/A	2	$70.00	$73
41	2	0	N/A	2	$18.00-$58.00	$19 - $60
42	2	0	N/A	2	$30.00-$137.00	$31 - $141
43	0	0	N/A	2	$210.00	$583
44	0	0	N/A	2	$164.00	$456
45	0	0	N/A	2	$123.00	$342
46	0	0	N/A	2	$250.00	$694
47	0	0	N/A	1	$16.00	$44
48	0	0	N/A	1	$10.00	$28
49	0	0	N/A	1	$10.00	$28
50	0	0	N/A	1	$18.00	$50
51	0	0	N/A	2	$559.00	$1,553
52	0	0	N/A	4	$92.00	$236
53	0	0	N/A	2	$47.00	$121
54	0	1	N/A	4	$183.00	$282
55	0	0	N/A	5	$90.00	$250
56	0	0	N/A	2	$145.00	$403
57	0	0	N/A	2	$110.00	$306
58	0	0	N/A	2	$17.00	$23
59	1	0	N/A	2	$23.00	$32
60	0	0	N/A	CN	.8M	1.4M
61	0	0	N/A	NFL	25M	44M
62	0	0	N/A	PEI	2.7M	5M
63	0	0	N/A	NS	33M	58M
64	0	0	N/A	NBW	25M	44M
65	0	0	N/A	QB	121M	212M
66	0	0	N/A	MN	38M	67M
67	0	0	N/A	SK	43M	75M
68	0	0	N/A	AB	114M	200M
69	0	0	N/A	BC	126M	221M
70	0	0	N/A	CN	987M	1249M

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
71	0	0	N/A	NFL	28M	37M
72	0	0	N/A	PEI	5M	6M
73	0	0	N/A	NS	48M	61M
74	0	0	N/A	NBW	40M	51M
75	0	0	N/A	QB	170M	215M
76	0	0	N/A	ON	371M	470M
77	0	0	N/A	MN	40M	51M
78	0	0	N/A	SK	34M	43M
79	0	0	N/A	AB	118M	149M
80	0	0	N/A	BC	133M	168M
81	0	0	N/A	4	$23.00	$45
82	0	0	N/A	4	$115.00	$209
83	0	0	N/A	4	N/A	N/A
84	0	0	N/A	2	$209.00	$265
85	0	0	N/A	2	$126.00	$152
86	0	0	N/A	3	$329.00	$396
87	0	0	N/A	2	$10.00	$45
88	0	0	N/A	4	$16.00	$73
89	1	0	N/A	2	$110.00	$500
90	1	0	N/A	4	$48.00	$218
91	1	0	N/A	2	$6.00	$27
92	1	0	N/A	4	$17.00	$77
93	0	0	N/A	1	$37.00	$45
94	0	0	N/A	1	$37.00	$45
95	0	0	N/A	2	$1,054.00	$1,211
96	0	0	N/A	2	$331.00	$380
97	0	0	N/A	2	$54.00	$62
98	0	0	N/A	2	$423.00	$486
99	0	0	N/A	1	$7.00	$9
100	0	0	N/A	1	$3.00	$4
101	0	0	N/A	1	$25.00	$34
102	0	0	N/A	1	$1.00	$1
103	0	0	N/A	4	N/A	N/A
104	1	0	N/A	4	$331.00	$460
105	1	0	N/A	4	$81.00	$113

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
106	1	0	N/A	4	$55.00	$76
107	1	0	N/A	3	$105.00	$146
108	1	0	N/A	3	$103.00	$143
109	1	0	N/A	3	$55.00	$76
110	0	0	N/A	2	$25.00	$33
111	0	0	N/A	4	$23.00	$35
112	1	0	N/A	4	$43.00	$66
113	0	0	N/A	4	$16.00	$25
114	1	0	N/A	4	$42.00	$65
115	0	1	N/A	2	$47.00	$142
116	1	0	N/A	1	$50.00	$132
117	1	0	N/A	1	$36.00	$95
118	1	0	N/A	1	$35.00	$92
119	1	0	N/A	1	$44.00	$116
120	1	0	N/A	1	$27.00	$71
121	1	0	N/A	1	$26.00	$68
122	1	0	N/A	1	$44.00	$116
123	1	0	N/A	1	$25.00	$66
124	1	0	N/A	1	$25.00	$66
125	1	0	N/A	1	$40.00	$105
126	1	0	N/A	1	$16.00	$42
127	1	0	N/A	1	$15.00	$39
128	1	0	N/A	1	$41.00	$108
129	1	0	N/A	1	$19.00	$50
130	1	0	N/A	1	$19.00	$50
131	0	0	N/A	4	$11.00	$20
132	0	0	N/A	4	$25.00	$38
133	0	0	N/A	4	$26.00	$40
134	1	0	N/A	2	$9.00	$12
135	0	0	N/A	1	$14.00	$30
136	0	0	N/A	2	$571,796.00	$2,598,950
137	0	0	N/A	2	$213,596.00	$970,891
138	0	0	N/A	2	$38,018.00	$172,809
139	0	0	N/A	2	$50,035,800.00	1.2B
140	0	0	N/A	2	$18.00	$32

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
141	0	0	N/A	2	$28.00	$49
142	0	0	N/A	2	$34.00	$60
143	0	0	N/A	2	$24.00	$42
144	0	0	N/A	2	$31.00	$54
145	0	0	N/A	2	$43.00	$75
146	0	0	N/A	2	$30.00	$53
147	0	0	N/A	2	$33.00	$58
148	0	0	N/A	2	$47.00	$82
149	0	0	N/A	2	$13.00	$23
150	0	0	N/A	2	$16.00	$28
151	0	0	N/A	5	$32.00	$56
152	0	0	N/A	5	$33.00	$58
153	0	0	N/A	5	$25.00	$44
154	0	0	N/A	5	$46.00	$81
155	0	0	N/A	5	$49.00	$86
156	0	0	N/A	5	$40.00	$70
157	0	0	N/A	5	$58.00	$102
158	0	0	N/A	5	$82.00	$144
159	0	0	N/A	5	$26.00	$46
160	0	0	N/A	2	$9,218,730.00	$16,173,211
161	0	0	N/A	2	$8,041,444.00	$14,107,797
162	0	0	N/A	2	$2,373,212.00	$4,163,529
163	0	0	N/A	2	$45.00	$45
164	0	0	N/A	2	$130.00	$131
165	0	0	N/A	2	$119.00	$120
166	1	0	N/A	2	$57.00	$58
167	1	0	N/A	2	$8,381,141.00	$8,465,799
168	0	0	N/A	5	$24.00	$26
169	0	0	N/A	2	$15.00	$16
170	2	0	N/A	2	$4,533 - $31,838	$5,964 - $41,892
171	0	0	N/A	CN	6B	6.3B
172	0	0	N/A	NFL	29M	30M
173	0	0	N/A	PEI	2M	2M
174	0	0	N/A	NS	32M	33M
175	0	0	N/A	NBW	25M	26M

	TRAVEL COST	HEDONIC	OTHER	BENEFICIARIES	BENEFIT VALUE	1994 $
176	0	0	N/A	QB	121M	126M
177	0	0	N/A	ON	251M	261M
178	0	0	N/A	MN	27M	28M
179	0	0	N/A	SK	22M	23M
180	0	0	N/A	AB	80M	83M
181	0	0	N/A	BC	113M	118M

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
1	3	1	1	1	1	1	1
2	3	1	1	1	1	1	1
3	3	1	1	1	1	1	1
4	3	1	1	1	1	1	1
5	3	1	1	1	1	1	1
6	3	1	1	1	1	1	1
7	3	1	1	1	1	1	1
8	3	1	1	1	1	1	1
9	3	1	1	1	1	1	1
10	3	1	1	1	1	1	1
11	3	1	1	1	1	1	1
12	3	1	1	1	1	1	1
13	3	1	1	1	1	1	1
14	3	1	1	1	1	1	0
15	3	1	1	1	1	1	0
16	3	1	1	1	1	1	0
17	7	1	0	0	0	0	0
18	7	1	0	0	0	0	0
19	4	1	1	1	1	1	0
20	7	1	1	1	1	1	1
21	4	0	1	1	1	1	1
22	4	0	1	1	1	1	1
23	4	0	1	1	1	1	1
24	4	0	1	1	1	0	1
25	4	0	1	1	1	0	1
26	4	0	1	1	1	1	1
27	4	0	1	1	1	1	1
28	3	N/A	N/A	N/A	N/A	N/A	N/A
29	3	N/A	N/A	N/A	N/A	N/A	N/A
30	3	N/A	N/A	N/A	N/A	N/A	N/A
31	3	N/A	N/A	N/A	N/A	N/A	N/A
32	3	1	0	0	1	1	1
33	3	1	0	0	0	1	1
34	7	1	1	1	1	1	1
35							

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
36	7	1	1	1	1	1	1
37	7	1	1	1	1	1	1
38	7	1	1	1	1	1	1
39	5	1	1	1	0	1	0
40	5	1	1	1	0	1	0
41	4	1	1	1	1	1	1
42	4	1	1	1	1	1	1
43	7	1	1	1	1	1	1
44	7	1	1	1	1	1	1
45	7	1	1	1	1	1	1
46	7	1	1	1	1	1	1
47	3	1	1	1	1	1	1
48	3	1	1	1	1	1	1
49	3	1	1	1	1	1	1
50	3	1	1	1	1	1	1
51	7	1	1	1	1	1	1
52	3	1	1	1	1	1	1
53	3	1	1	1	1	1	1
54	8	1	0	0	0	0	0
55	7	1	1	1	0	1	1
56	7	1	1	1	1	1	1
57	7	1	1	1	1	1	1
58	3	0	1	1	0	1	0
59	3	0	1	1	0	1	0
60	9	0	1	1	0	1	0
61	9	0	1	1	0	1	0
62	9	0	1	1	0	1	0
63	9	0	1	1	0	1	0
64	9	0	1	1	0	1	0
65	9	0	1	1	0	1	0
66	9	0	1	1	0	1	0
67	9	0	1	1	0	1	0
68	9	0	1	1	0	1	0
69	9	0	1	1	0	1	0
70	9	0	1	1	0	1	0

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
71	9	0	1	1	0	1	0
72	9	0	1	1	0	1	0
73	9	0	1	1	0	1	0
74	9	0	1	1	0	1	0
75	9	0	1	1	0	1	0
76	9	0	1	1	0	1	0
77	9	0	1	1	0	1	0
78	9	0	1	1	0	1	0
79	9	0	1	1	0	1	0
80	9	0	1	1	0	1	0
81	3	1	1	1	0	1	0
82	7	1	1	1	0	1	0
83	N/A	1	1	1	0	1	0
84	4	1	1	1	1	1	0
85	4	1	1	1	1	1	1
86	4	1	1	1	1	1	1
87	3	1	1	1	1	1	0
88	3	1	1	1	1	1	0
89	3	1	1	1	1	1	0
90	3	1	1	1	1	1	0
91	3	1	1	1	1	1	0
92	3	1	1	1	1	1	0
93	4	1	1	1	0	1	0
94	4	1	1	1	0	1	0
95	7	1	1	1	1	1	0
96	7	1	1	1	1	1	0
97	7	1	1	1	1	1	0
98	7	1	1	1	1	1	0
99	3	1	1	1	1	1	1
100	3	1	1	1	1	1	1
101	7	1	1	1	1	1	1
102	3	1	1	1	1	1	1
103	N/A	1	1	1	1	1	1
104	7	1	1	1	1	1	1
105	7	1	1	1	1	1	1

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
106	7	1	1	1	1	1	1
107	7	1	1	1	1	1	1
108	7	1	1	1	1	1	1
109	7	1	1	1	1	1	1
110	7	1	1	1	1	1	0
111	4	0	1	1	1	1	1
112	4	0	1	1	1	1	1
113	4	0	1	1	1	1	1
114	4	0	1	1	1	1	1
115	3	1	1	1	1	1	1
116	3	1	1	0	1	1	0
117	3	1	1	0	1	1	0
118	3	1	1	0	1	1	0
119	3	1	1	0	1	1	0
120	3	1	1	0	1	1	0
121	3	1	1	0	1	1	0
122	3	1	1	0	1	1	0
123	3	1	1	0	1	1	0
124	3	1	1	0	1	1	0
125	3	1	1	0	1	1	0
126	3	1	1	0	1	1	0
127	3	1	1	0	1	1	0
128	3	1	1	0	1	1	0
129	3	1	1	0	1	1	0
130	3	1	1	0	1	1	0
131	5	1	0	0	0	0	0
132	7	1	0	1	0	1	0
133	7	1	0	1	0	1	0
134	1	1	1	1	1	1	1
135	3	1	0	0	0	1	0
136	5	0	0	0	0	0	0
137	5	0	0	0	0	0	0
138	5	0	0	0	0	0	0
139	5	1	1	1	1	1	0
140	3	1	1	1	0	1	1

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
141	3	1	1	1	0	1	1
142	3	1	1	1	0	1	1
143	3	1	1	1	0	1	1
144	3	1	1	1	0	1	1
145	3	1	1	1	0	1	1
146	3	1	1	1	0	1	1
147	3	1	1	1	0	1	1
148	3	1	1	1	0	1	1
149	3	1	1	1	0	1	1
150	3	1	1	1	0	1	1
151	3	1	1	1	0	1	0
152	3	1	1	1	0	1	0
153	3	1	1	1	0	1	0
154	3	1	1	1	0	1	0
155	3	1	1	1	0	1	0
156	3	1	1	1	0	1	0
157	3	1	1	1	0	1	0
158	3	1	1	1	0	1	0
159	3	1	1	1	0	1	0
160	5	N/A	N/A	N/A	N/A	N/A	N/A
161	5	N/A	N/A	N/A	N/A	N/A	N/A
162	5	N/A	N/A	N/A	N/A	N/A	N/A
163	7	N/A	N/A	N/A	N/A	N/A	N/A
164	7	N/A	N/A	N/A	N/A	N/A	N/A
165	7	N/A	N/A	N/A	N/A	N/A	N/A
166	4	N/A	N/A	N/A	N/A	N/A	N/A
167	5	N/A	N/A	N/A	N/A	N/A	N/A
168	3	1	1	1	1	1	0
169	3	1	1	1	1	1	0
170	5	N/A	N/A	N/A	N/A	N/A	N/A
171	9	0	1	1	0	1	0
172	9	0	1	1	0	1	0
173	9	0	1	1	0	1	0
174	9	0	1	1	0	1	0
175	9	0	1	1	0	1	0

	DENOMINATIONS	DEMOGRAPHICS	EXPENDITURES	TRIPS MADE	DISTANCE	DURATION	PARTY SIZE
176	9	0	1	1	0	1	0
177	9	0	1	1	0	1	0
178	9	0	1	1	0	1	0
179	9	0	1	1	0	1	0
180	9	0	1	1	0	1	0
181	9	0	1	1	0	1	0

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
1	0	1	1	3	N/A	$20/yr	$76/yr	$179/yr
2	0	1	1	3	N/A	$14/yr	$72/yr	$146/yr
3	0	1	1	3	N/A	$97/yr	$313/yr	$652/yr
4	0	1	1	3	N/A	$18/yr	$84/yr	$200/yr
5	0	1	1	3	N/A	$8/yr	$39/yr	$103/yr
6	0	1	1	3	N/A	$20/yr	$76/yr	$179/yr
7	0	1	1	3	N/A	$14/yr	$72/yr	$146/yr
8	0	1	1	3	N/A	$97/yr	$313/yr	$652/yr
9	0	1	1	3	N/A	$18/yr	$84/yr	$200/yr
10	0	1	1	3	N/A	$8/yr	$39/yr	$103/yr
11	0	1	0	3	$3	$9/yr	N/A	$73/yr
12	0	1	0	3	$3-$8	$4/yr	N/A	$25/yr
13	1	1	0	3	$6	$13/tr	$40/tr	$43/tr
14	1	1	0	3	$6	N/A	N/A	N/A
15	0	1	1	3	$7	N/A	N/A	N/A
16	0	1	1	3	$7	N/A	N/A	N/A
17	0	1	1	3	$7	N/A	N/A	N/A
18	0	1	0	3	N/A	N/A	N/A	N/A
19	0	1	0	3	N/A	N/A	N/A	N/A
20	0	1	0	1	N/A	N/A	N/A	N/A
21	0	1	1	3	N/A	N/A	N/A	N/A
22	1	0	0	2	N/A	$86/tr	$84/tr	$92/tr
23	1	0	0	2	N/A	$86/tr	$84/tr	$92/tr
24	1	0	0	3	N/A	N/A	N/A	N/A
25	0	0	0	2	N/A	N/A	N/A	N/A
26	0	0	0	2	N/A	$39/tr	$8/tr	$30/tr
27	0	0	0	2	N/A	N/A	N/A	N/A
28	0	0	0	2	N/A	$2/day	$10/day	$12/day
29	N/A	N/A	N/A	N/A	$71	N/A	N/A	N/A
30	N/A	N/A	N/A	N/A	$71	N/A	N/A	N/A
31	N/A	N/A	N/A	N/A	$71	N/A	N/A	N/A
32	N/A	N/A	N/A	N/A	$71	N/A	N/A	N/A
33	1	1	0	1	N/A	N/A	N/A	N/A
34	1	1	0	3	N/A	N/A	N/A	N/A
35	0	1	0	3	N/A	N/A	N/A	N/A

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
36	0	1	0	3	N/A	N/A	N/A	N/A
37	0	1	0	3	N/A	N/A	N/A	N/A
38	0	1	0	3	N/A	N/A	N/A	N/A
39	0	1	0	3	N/A	N/A	N/A	N/A
40	0	1	0	3	N/A	N/A	N/A	N/A
41	0	1	0	3	N/A	N/A	N/A	N/A
42	0	1	0	3	N/A	N/A	N/A	N/A
43	0	1	0	3	$10	$9/yr	$40/yr	$66/yr
44	0	1	0	3	$7	$8/yr	$19/yr	$37/yr
45	0	1	0	3	$8	$9/yr	$20/yr	$46/yr
46	0	1	0	3	$13	$13/yr	$41/yr	$78/yr
47	0	1	0	3	N/A	N/A	N/A	N/A
48	0	1	0	3	N/A	N/A	N/A	N/A
49	0	1	0	3	N/A	N/A	N/A	N/A
50	0	1	0	3	$13	N/A	N/A	N/A
51	0	1	0	3	$13	N/A	N/A	N/A
52	0	1	0	3	$53	N/A	N/A	N/A
53	0	1	0	3	$8	N/A	N/A	N/A
54	0	1	0	2	$1-$5000	N/A	N/A	N/A
55	0	1	0	3	$4	N/A	N/A	N/A
56	0	1	0	3	$4	N/A	N/A	N/A
57	0	1	0	3	$4	N/A	N/A	N/A
58	0	0	0	3	$26	N/A	N/A	N/A
59	0	0	0	3	$26	N/A	N/A	N/A
60	0	0	0	3	N/A	N/A	N/A	N/A
61	0	0	0	3	N/A	N/A	N/A	N/A
62	0	0	0	3	N/A	N/A	N/A	N/A
63	0	0	0	3	N/A	N/A	N/A	N/A
64	0	0	0	3	N/A	N/A	N/A	N/A
65	0	0	0	3	N/A	N/A	N/A	N/A
66	0	0	0	3	N/A	N/A	N/A	N/A
67	0	0	0	3	N/A	N/A	N/A	N/A
68	0	0	0	3	N/A	N/A	N/A	N/A
69	0	0	0	3	N/A	N/A	N/A	N/A
70	0	0	0	3	N/A	N/A	N/A	N/A

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
71	0	0	0	3	N/A	N/A	N/A	N/A
72	0	0	0	3	N/A	N/A	N/A	N/A
73	0	0	0	3	N/A	N/A	N/A	N/A
74	0	0	0	3	N/A	N/A	N/A	N/A
75	0	0	0	3	N/A	N/A	N/A	N/A
76	0	0	0	3	N/A	N/A	N/A	N/A
77	0	0	0	3	N/A	N/A	N/A	N/A
78	0	0	0	3	N/A	N/A	N/A	N/A
79	0	0	0	3	N/A	N/A	N/A	N/A
80	0	0	0	3	N/A	N/A	N/A	N/A
81	0	0	0	3	N/A	N/A	N/A	$60M/yr
82	0	0	0	3	N/A	N/A	N/A	$19M/yr
83	0	0	0	3	N/A	N/A	N/A	N/A
84	1	1	0	3	N/A	N/A	$30/tr	#33/tr
85	1	1	0	3	N/A	$13/tr	N/A	$17/tr
86	1	1	0	3	N/A	$181/tr	N/A	$266/tr
87	0	1	0	3	$3.00-$8.00	N/A	N/A	N/A
88	0	1	0	3	$15.00-$150.00	N/A	N/A	N/A
89	0	1	0	3	$3.00-$8.00	N/A	N/A	N/A
90	0	1	0	3	$15.00-$150.00	N/A	N/A	N/A
91	0	1	0	3	$3.00-$8.00	N/A	N/A	N/A
92	0	1	0	3	$15.00-$150.00	N/A	N/A	N/A
93	0	1	0	3	$2	N/A	$6/day	$2/day
94	0	1	0	3	$3	N/A	$5/day	$3/day
95	0	1	0	3	N/A	$128/yr	$246/yr	$386/yr
96	0	1	0	3	N/A	$128/yr	$246/yr	$386/yr
97	0	1	0	3	N/A	$128/yr	$246/yr	$386/yr
98	0	1	0	3	N/A	$128/yr	$246/yr	$386/yr
99	1	1	0	1	N/A	N/A	$3/tr	$5/tr
100	1	1	0	1	N/A	N/A	$2/tr	$4/tr
101	1	1	0	2	N/A	N/A	N/A	N/A
102	1	1	0	2	N/A	N/A	N/A	N/A
103	1	1	0	2	N/A	$381/tr	$317/tr	$441/tr
104	1	1	1	3	N/A	N/A	N/A	N/A
105	1	1	1	3	N/A	N/A	N/A	N/A

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
106	1	1	1	3	N/A	N/A	N/A	N/A
107	1	1	1	3	N/A	N/A	N/A	N/A
108	1	1	1	3	N/A	N/A	N/A	N/A
109	1	1	1	3	N/A	N/A	N/A	N/A
110	0	0	0	3	N/A	N/A	N/A	N/A
111	0	0	0	2	N/A	N/A	N/A	N/A
112	0	0	0	2	N/A	N/A	N/A	N/A
113	0	0	0	2	N/A	N/A	N/A	N/A
114	0	0	0	2	N/A	N/A	N/A	N/A
115	0	1	0	3	N/A	N/A	N/A	N/A
116	0	0	0	3	N/A	N/A	N/A	N/A
117	0	0	0	3	N/A	N/A	N/A	N/A
118	0	0	0	3	N/A	N/A	N/A	N/A
119	0	0	0	3	N/A	N/A	N/A	N/A
120	0	0	0	3	N/A	N/A	N/A	N/A
121	0	0	0	3	N/A	N/A	N/A	N/A
122	0	0	0	3	N/A	N/A	N/A	N/A
123	0	0	0	3	N/A	N/A	N/A	N/A
124	0	0	0	3	N/A	N/A	N/A	N/A
125	0	0	0	3	N/A	N/A	N/A	N/A
126	0	0	0	3	N/A	N/A	N/A	N/A
127	0	0	0	3	N/A	N/A	N/A	N/A
128	0	0	0	3	N/A	N/A	N/A	N/A
129	0	0	0	3	N/A	N/A	N/A	N/A
130	0	0	0	3	N/A	N/A	N/A	N/A
131	0	1	0	3	N/A	N/A	N/A	N/A
132	0	1	0	3	N/A	N/A	N/A	N/A
133	0	1	0	3	N/A	N/A	N/A	N/A
134	1	1	1	1	N/A	N/A	N/A	N/A
135	0	0	0	1	N/A	N/A	N/A	N/A
136	0	0	0	0	N/A	N/A	N/A	N/A
137	0	0	0	0	N/A	N/A	N/A	N/A
138	0	0	0	0	N/A	N/A	N/A	N/A
139	0	1	0	3	N/A	N/A	N/A	N/A
140	0	1	0	3	$11	$5/day	$5/day	$25/day

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
141	0	1	0	3	$17	$10/day	$10/day	$47/day
142	0	1	0	3	$17	$7/day	$7/day	$38/day
143	0	1	0	3	$11	$4/day	$4/day	$18/day
144	0	1	0	3	$17	$5/day	$5/day	$21/day
145	0	1	0	3	$42	$8/day	$8/day	$38/day
146	0	1	0	3	$17	$5/day	$5/day	$20/day
147	0	1	0	3	$22	$12/day	$12/day	$52/day
148	0	1	0	3	$32	$8/day	$8/day	$39/day
149	0	1	0	3	$8	$2/day	$2/day	$5/day
150	0	1	0	3	$9	$2/day	$2/day	$8/day
151	0	1	0	3	$40	$10/day	$10/day	$51/day
152	0	1	0	3	$100	$12/day	$12/day	$60/day
153	0	1	0	3	$50	$8/day	$8/day	$41/day
154	0	1	0	3	$100	$24/day	$24/day	$48/day
155	0	1	0	3	$300	$24/day	$24/day	$48/day
156	0	1	0	3	$100	$8/day	$8/day	$36/day
157	0	1	0	3	$100	$13/day	$13/day	$57/day
158	0	1	0	3	$250	$9/day	$9/day	$49/day
159	0	1	0	3	$75	$10/day	$10/day	$54/day
160	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
163	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A
164	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A
165	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A
166	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
167	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A
168	0	1	0	3	N/A	N/A	N/A	N/A
169	0	1	0	3	N/A	N/A	N/A	N/A
170	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
171	0	0	0	3	N/A	341M/yr	563M/yr	863M/yr
172	0	0	0	3	N/A	4M/yr	15M/yr	32M/yr
173	0	0	0	3	N/A	.6M/yr	.7M/yr	1M/yr
174	0	0	0	3	N/A	5M/yr	13M/yr	22M/yr
175	0	0	0	3	N/A	7M/yr	15M/yr	23M/yr

	SUBSTITUTE SITE	FAMILY INCOME	VALUE OF TIME	SURVEY USED	LICENSE FEE	LODGING	FOOD	TRAVEL
176	0	0	0	3	N/A	90M/yr	131M/yr	194M/yr
177	0	0	0	3	N/A	121M/yr	177M/yr	245M/yr
178	0	0	0	3	N/A	9M/yr	18M/yr	29M/yr
179	0	0	0	3	N/A	10M/yr	14M/yr	28M/yr
180	0	0	0	3	N/A	47M/yr	71M/yr	121M/yr
181	0	0	0	3	N/A	47M/yr	109M/yr	168M/yr

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
1	$23/yr	2	$26/yr	$376/yr	$561/yr
2	$44/yr	2	$24/yr	$431/yr	$643/yr
3	$170/yr	2	$63/yr	$1889/yr	$2819/yr
4	$33/yr	2	$29/yr	$429/yr	$640/yr
5	$6/yr	2	$11/yr	$217/yr	$324/yr
6	$23/yr	2	$26/yr	$376/yr	$561/yr
7	$44/yr	2	$24/yr	$431/yr	$643/yr
8	$170/yr	2	$63/yr	$1889/yr	$2819/yr
9	$33/yr	2	$29/yr	$429/yr	$640/yr
10	$6/yr	2	$11/yr	$217/yr	$324/yr
11	$17/yr	5	$19/yr	N/A	N/A
12	$10/yr	2	$15/yr	$69/yr	$283/yr
13	$18/tr	3	$3/tr	$239/yr	$1039/yr
14	N/A	0	N/A	N/A	N/A
15	N/A	0	N/A	N/A	N/A
16	N/A	0	N/A	N/A	N/A
17	N/A	0	N/A	N/A	N/A
18	N/A	0	N/A	N/A	N/A
19	N/A	0	N/A	N/A	N/A
20	N/A	0	N/A	$224/tr	$257/tr
21	N/A	0	N/A	N/A	N/A
22	N/A	0	N/A	N/A	N/A
23	N/A	0	N/A	N/A	N/A
24	N/A	0	N/A	N/A	N/A
25	N/A	0	N/A	N/A	N/A
26	N/A	2	$8/tr	$39/tr	$51/tr
27	N/A	0	N/A	N/A	N/A
28	N/A	2	$10/day	N/A	N/A
29	N/A	0	N/A	N/A	N/A
30	N/A	0	N/A	N/A	N/A
31	N/A	0	N/A	N/A	N/A
32	N/A	0	N/A	N/A	N/A
33	N/A	0	N/A	N/A	N/A
34	N/A	0	N/A	N/A	N/A
35	N/A	0	N/A	N/A	N/A

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
36	N/A	0	N/A	N/A	N/A
37	N/A	0	N/A	N/A	N/A
38	N/A	0	N/A	N/A	N/A
39	N/A	0	N/A	N/A	N/A
40	N/A	0	N/A	N/A	N/A
41	N/A	0	N/A	N/A	N/A
42	N/A	0	N/A	N/A	N/A
43	$4/yr	2	$12/yr	$153/yr	$392/yr
44	$5/yr	2	$14/yr	$101/yr	$259/yr
45	$5/yr	2	$30/yr	$120/yr	$308/yr
46	$7/yr	2	$30/yr	$194/yr	$497/yr
47	N/A	0	N/A	N/A	N/A
48	N/A	0	N/A	N/A	N/A
49	N/A	0	N/A	N/A	N/A
50	N/A	0	N/A	N/A	N/A
51	N/A	0	N/A	N/A	N/A
52	N/A	0	N/A	N/A	N/A
53	N/A	0	N/A	N/A	N/A
54	N/A	0	N/A	N/A	N/A
55	N/A	0	N/A	N/A	N/A
56	N/A	0	N/A	N/A	N/A
57	N/A	0	N/A	N/A	N/A
58	N/A	0	N/A	N/A	N/A
59	N/A	0	N/A	N/A	N/A
60	N/A	0	N/A	N/A	N/A
61	N/A	0	N/A	N/A	N/A
62	N/A	0	N/A	N/A	N/A
63	N/A	0	N/A	N/A	N/A
64	N/A	0	N/A	N/A	N/A
65	N/A	0	N/A	N/A	N/A
66	N/A	0	N/A	N/A	N/A
67	N/A	0	N/A	N/A	N/A
68	N/A	0	N/A	N/A	N/A
69	N/A	0	N/A	N/A	N/A
70	N/A	0	N/A	N/A	N/A

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
71	N/A	0	N/A	N/A	N/A
72	N/A	0	N/A	N/A	N/A
73	N/A	0	N/A	N/A	N/A
74	N/A	0	N/A	N/A	N/A
75	N/A	0	N/A	N/A	N/A
76	N/A	0	N/A	N/A	N/A
77	N/A	0	N/A	N/A	N/A
78	N/A	0	N/A	N/A	N/A
79	N/A	0	N/A	N/A	N/A
80	N/A	0	N/A	N/A	N/A
81	N/A	0	$32M/yr	$84/person	$106/person
82	N/A	0	$23M/yr	$46/person	$58/person
83	N/A	0	N/A	N/A	N/A
84	$49/tr	0	N/A	$112/tr	$127/tr
85	N/A	5	$20/tr	$50/tr	$55/tr
86	N/A	5	$188/tr	$636/tr	$699/tr
87	N/A	0	N/A	N/A	N/A
88	N/A	0	N/A	N/A	N/A
89	N/A	0	N/A	N/A	N/A
90	N/A	0	N/A	N/A	N/A
91	N/A	0	N/A	N/A	N/A
92	N/A	0	N/A	N/A	N/A
93	$2/day	5	$2/day	$12(Av/count)	$13(Av/count)
94	N/A	5	$2/day	$11(Av/count)	$11(Av/count)
95	$75/yr	5	$246/yr	$1437/yr	$1497/yr
96	$75/yr	5	$246/yr	$1437/yr	$1497/yr
97	$75/yr	5	$246/yr	$1437/yr	$1497/yr
98	$75/yr	5	$246/yr	$1437/yr	$1497/yr
99	$1/tr	5	$4/tr	$13/tr	$16/tr
100	N/A	5	$2/tr	$8/tr	$10/tr
101	N/A	0	N/A	$1/tr	$1/tr
102	N/A	0	N/A	$1/tr	$1/tr
103	$54/tr	5	$124/tr	$2265/tr	$2867/tr
104	N/A	5	$279/yr	$530/yr	$638/yr
105	N/A	5	$378/yr	$763/yr	$919/yr

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
106	N/A	5	$307/yr	$690/yr	$831/yr
107	N/A	5	$251/yr	$1301/yr	$1567/yr
108	N/A	5	$689/yr	$2557/yr	$3081/yr
109	N/A	5	$563/yr	$2490/yr	$3000/yr
110	N/A	5	$549/tr	$431/tr	$567/tr
111	N/A	0	N/A	N/A	N/A
112	N/A	0	N/A	N/A	N/A
113	N/A	0	N/A	N/A	N/A
114	N/A	0	N/A	N/A	N/A
115	N/A	0	N/A	N/A	N/A
116	N/A	0	N/A	N/A	N/A
117	N/A	0	N/A	N/A	N/A
118	N/A	0	N/A	N/A	N/A
119	N/A	0	N/A	N/A	N/A
120	N/A	0	N/A	N/A	N/A
121	N/A	0	N/A	N/A	N/A
122	N/A	0	N/A	N/A	N/A
123	N/A	0	N/A	N/A	N/A
124	N/A	0	N/A	N/A	N/A
125	N/A	0	N/A	N/A	N/A
126	N/A	0	N/A	N/A	N/A
127	N/A	0	N/A	N/A	N/A
128	N/A	0	N/A	N/A	N/A
129	N/A	0	N/A	N/A	N/A
130	N/A	0	N/A	N/A	N/A
131	N/A	0	N/A	N/A	N/A
132	N/A	0	N/A	N/A	N/A
133	N/A	0	N/A	N/A	N/A
134	N/A	0	N/A	N/A	N/A
135	N/A	0	N/A	N/A	N/A
136	N/A	0	N/A	N/A	N/A
137	N/A	0	N/A	N/A	N/A
138	N/A	0	N/A	N/A	N/A
139	N/A	0	N/A	N/A	N/A
140	$16/day	2	$22/day	$78/day	$107/day

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
141	$15/day	2	$34/day	$135/day	$185/day
142	$20/day	2	$28/day	$114/day	$156/day
143	$5/day	2	$14/day	$52/day	$71/day
144	$6/day	2	$15/day	$61/day	$84/day
145	$19/day	2	$33/day	$125/day	$171/day
146	$5/day	2	$15/day	$57/day	$78/day
147	$23/day	2	$44/day	$163/day	$223/day
148	$16/day	2	$29/day	$117/day	$106/day
149	$2/day	2	$7/day	$16/day	$22/day
150	$3/day	2	$14/day	$29/day	$40/day
151	$180/day	2	$21/day	$300/day	$411/day
152	$316/day	2	$21/day	$471/day	$645/day
153	$144/day	2	$18/day	$241/day	$330/day
154	$210/day	2	$27/day	$333/day	$456/day
155	$224/day	2	$22/day	$349/day	$478/day
156	$145/day	2	$13/day	$237/day	$325/day
157	$298/day	2	$23/day	$451/day	$618/day
158	$308/day	2	$16/day	$424/day	$581/day
159	$235/day	2	$25/day	$371/day	$508/day
160	N/A	0	N/A	N/A	N/A
161	N/A	0	N/A	N/A	N/A
162	N/A	0	N/A	N/A	N/A
163	N/A	0	N/A	N/A	N/A
164	N/A	0	N/A	N/A	N/A
165	N/A	0	N/A	N/A	N/A
166	N/A	0	N/A	N/A	N/A
167	N/A	0	N/A	N/A	N/A
168	N/A	0	N/A	N/A	N/A
169	N/A	0	N/A	N/A	N/A
170	N/A	0	N/A	N/A	N/A
171	341M/yr	5	1506M/yr	5567M/yr	5567M/yr
172	11M/yr	5	55M/yr	127M/yr	127M/yr
173	1M/yr	5	2M/yr	10M/yr	10M/yr
174	10M/yr	5	22M/yr	111M/yr	111M/yr
175	13M/yr	5	48M/yr	138M/yr	138M/yr

	MISC.	CAPITAL GOOD	VALUE	TOTAL EXPEND.	TOTAL EXP. '94$
176	78M/yr	5	229M/yr	1018M/yr	1018M/yr
177	110M/yr	5	372M/yr	2021M/yr	2021M/yr
178	13M/yr	5	39M/yr	159M/yr	159M/yr
179	15M/yr	5	59M/yr	173M/yr	173M/yr
180	43M/yr	5	305M/yr	835M/yr	835M/yr
181	47M/yr	5	376M/yr	977M/yr	977M/yr
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