

Importance of big-game non-resident hunters: The case of moose hunting in the state of Maine

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SUMMARY

This paper's interest lies in understanding the importance of big-game non-resident hunters and to illustrate this situation, it draws on the State of Maine as a case study. More than 13 million people participated in recreational hunting in the United States in 2001 and spent approximately 20 billion US dollars on hunting activities. Tourists visiting Maine also spend billions of dollars and are a very important part of the Maine economy. Moose hunting is an important part of the Maine tourism product and image. This study has attempted to profile the needs, satisfaction, participation, and socio-demographic characteristics of non-resident Maine moose hunters. The typical non-resident is a Caucasian male from the Northeastern region of the country who lives in rural areas, age 45 years or older, primarily interested in the hunting experience, even if he does not harvest a moose. Nearly 90% are satisfied with the overall experience of hunting moose in Maine. However, even if moose hunting in Maine is healthy, the future of hunting is not. Some of the major reasons for this uncertainty include: firearm restrictions, urbanization and loss of hunting tradition, the anti-hunting movement and society's increased concern for all wildlife species, a change in the age-sex structure of hunters, increased cost and complication of hunting, public perception that hunting threatens game populations, and dissatisfaction with the government's ability to properly manage the game resource and all hunters. Consequently, if the state wishes to maintain its status with regard to moose hunting, it will need to consolidate its strengths and address its weaknesses.

Key words:

moose hunting; nature-based tourism; nature-based recreation; perceptions; attitudes; Maine

INTRODUCTION

Hunting and big game hunting is an important recreational activity for several communities in the United States. These communities are sometimes dependent on hunting for a number of reasons. It provides both recreation and food for the community, and hunting makes a significant contribution to local economies by attracting tourists who might not otherwise visit those areas (IAFWA 2002).

This paper's interest lies in understanding the importance of big-game non-resident hunters. It begins by reviewing recent American trends in hunting, big-game hunting, and non-resident hunting. This will demonstrate that hunting and big-game hunting and non-resident hunting is a significant culture and economic activity in the United States. It has a particular impact for some states and specific communities. To illustrate this situation, the paper draws on the State of Maine as a case study.

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OVERVIEW OF HUNTING AND BIG GAME HUNTING IN THE UNITED STATES

According to Table 1, in 2001, a little more than 13 million people enjoyed recreational hunting in the United States, which was slightly lower than in 1991 (slightly over 14 million) and 1996 (slightly lower than 14 million). Hence, they hunted more than 228 million days. Of all the types of hunting small game, migratory bird and big game, the latter was most popular in 2001. Approximately 11.0 million hunters pursued big game such as deer and elk on 153 million days. Contrary to the declining trend of hunting in general, big game hunting, including deer, elk, bear, and wild turkey has stayed fairly stable between 1991 and 2001. In the general population of hunters the trend is more eclectic with increases in hunting-days between 1991 (236 million) and 1996 (257 million), while there was a significant decrease between 1996 and 2001 where the number of hunting days went down to 228 million days which was lower than the number of hunting-days in 1991.

Table 1
TRENDS IN HUNTING PARTICIPATION AND HUNTING-DAYS IN THE UNITED STATES (Numbers in thousands)

	1991	1996	2001
Number of hunters			
Big game	10,745	11,288	10,911
Small game	7,642	6,945	5,434
Migratory bird	3,009	3,073	2,956
Other animals	1,411	1,521	1,047
TOTAL	14,063	13,975	13,034
Number of hunting-days			
Big game	128,411	153,784	153,191
Small game	77,132	75,117	60,142
Migratory bird	22,235	26,501	29,310
Other animals	19,340	24,522	19,207
TOTAL	235,806	256,676	228,368

Source: USFWS (2002)

Of the 13 million hunters in 2001, 2 million went to hunt in another state (Table 2). Furthermore, big game hunting was a significant part of non-resident hunting. Approximately 1.5 million hunters participated in big game hunting in another state and they hunted more than 14 million hunting days during 6 million hunting trips. This represents more than half of all non-resident hunting in the United States. The profile of hunters and big game hunters is very similar - majority of hunters are male, are older than 35, have at least a high school education, make more than 40,000 US dollars, are white and come from a rural setting.

Hunting expenditures totalled almost 21 billion dollars (Table 3). This is a significant number which is particularly important for some rural communities (IAFWA 2002). However, even if this is a significant number, it is lower than the 23 billion dollars in 1996.

Furthermore the breakdown of spending in 2001 is 5 billion US dollars for trips, 10 billion US dollars on equipment and 5 billion dollars on other expenses which might include: memberships, licenses and land leasing or ownership.

When breaking down expenditures, it is interesting to note that big game hunting expenditures (10 billion US dollars) represent approximately half of all hunting expenditures (20 billion US dollars). These expenditures fall into two main categories that include trips and equipment. Trip-related expenditures total approximately 5 billion US dollars for all hunters and a little more than 3.5 billion for big game hunters (Table 4).

These expenditures include food, lodging, transportation, guiding and rentals. From the perspective of equipment, hunters like a lot of gadgets. Hunters in general spent more than 10 billion dollars on equipment and big game hunters can account for almost 8 billion dollars of the whole amount. It is also important to mention that hunters also spend money on magazines/books, memberships, licenses and purchasing or rental of land.

As presented by the IAFWA (2002), hunters are good for the American economy. As stated in Table 5, before a hunting trip, they will purchase hunting gear, all terrain vehicles (ATVs) and boats, and they will also fill up their gas tanks and coolers with food. Furthermore, during the trip, they stay at motels and resorts and they eat in restaurants. On average, each hunter spends \$1,896 per year on hunting, which represents about 5% of the typical wage earner's annual income (IAFWA 2002). These expenditures have direct, indirect and induced impacts through the economy, generating an important impact for the U.S. economy. Hence, many communities depend on resident and non-resident hunters. For these communities, hunting represents an important source of economic growth.

Hunting's positive economic impact creates jobs and helps urban and rural communities throughout the United States. They represent financial opportunity for every American community, especially rural economies.

Table 2
**RESIDENT AND NON-RESIDENT PARTICIPATION, TRIPS AND HUNTING-DAYS
 BY TYPES OF HUNTING (Numbers in thousands)**

	All hunting	Big game	Small game	Migratory bird	Other animals
Number of hunters					
Resident	12,375	10,365	5,093	2,766	1,004
Non-resident	2,079	1,467	672	410	102
TOTAL	13,034	10,911	5,434	2,956	1,047
Trips					
Resident	189,499	108,154	44,394	22,569	14,382
Non-resident	10,626	6,291	2,056	1,586	692
TOTAL	200,125	114,445	46,450	24,155	15,074
Hunting-days					
Resident	209,880	138,809	55,386	26,672	18,156
Non-resident	20,891	14,386	4,756	2,638	1,051
TOTAL	228,368	153,191	60,142	29,310	19,207

Source: USFWS (2002)

Table 3
**TRENDS HUNTING EXPENDITURES
 (Numbers in thousands of US dollars)**

	1991	1996	2001
Trips	4,471,065	5,825,510	5,252,391
Equipment	6,716,497	12,738,229	10,361,495
Other	4,843,635	4,729,416	4,997,139
TOTAL	16,031,197	23,293,156	20,611,025

Source: USFWS (2002)

Each purchase made by hunters set off a chain reaction of economic benefits. As presented in Table 5, hunters purchasing hunting gear have an impact that goes beyond the simple purchase of the equipment; there is a ripple or multiplier effect.

As mentioned, the present paper studies and compares hunting in the United States with, on a more local level, a specific look at moose hunting in the state of Maine. A state renowned for such an opportunity is located in the north eastern United States near Canada.

Maine's economy and tourism industry is largely based on its large areas of forest, coastal waters, diversified wildlife, and scenery (Benson 1994). Twenty-five percent of Maine's income is derived from businesses dependent on natural resources. Resident and non-resident hunting is included in these activities and has direct, indirect and induced impact on many other businesses in the state.

This paper specifically explores big-game (moose) non-resident hunting in the state of Maine. It is the largest of the New England states of the Northeastern United States. It is bordered by New Hampshire, the Canadian provinces of Quebec, New Brunswick, and the Atlantic Ocean. Maine's economy had traditionally been based in manufacturing. However, in the last 30 years it has successfully transformed a major portion of its economy into trade, service, and finance industries.

Over 80% of Maine is forested with great stands of white pine, hemlock, spruce, fir, and hardwoods. Sheltered by the woods and with abundant water from numerous lakes, particularly in the northern counties, wildlife includes moose, deer, black bear, and smaller animals; fish and fowl are also plentiful. All the forested land holds a strong appeal for tourists, recreational and seasonal visitors including hunters.

Table 4
DETAILED HUNTING AND BIG GAME HUNTING EXPENDITURES IN 2001 (Numbers in thousands of US dollars)

	Hunting	Big game hunting
Trip-related expenditures		
Food	1,980,395	1,377,078
Lodging	469,547	310,785
Transportation	1,789,320	1,128,366
Package fees (including guiding)	377,233	298,823
Public land use fees	53,499	38,104
Private land use fees	370,858	271,648
Equipment rentals	36,395	22,393
TOTAL*	5,252,391	3,565,342
Hunting equipment expenditures		
Firearms	1,966,867	921,215
Archery equipment	462,097	439,302
Telescopic equipment	307,033	242,892
Decoys and calls	139,686	44,511
Ammunition	651,896	264,359
TOTAL*	4,561,709	2,218,798
Auxiliary equipment		
Camping equipment	113,661	87,188
Special clothing	463,990	313,551
Processing and taxidermy	385,947	349,914
TOTAL*	1,202,845	935,142
Special equipment		
Includes boats, campers, cabins, all-terrain vehicles (ATV), etc...	4,596,942	3,368,648
Other expenditures		
Magazines, books	84,530	N/A
Membership dues and contributions	243,678	N/A
Land leasing and ownership	3,975,892	N/A
Licenses, stamps, tags and permits	693,038	N/A
TOTAL EXPENDITURES*	20,611,025	10,087,930

Source: USFWS (2002)

* Expenditures may not add up to total since not all

Table 5
TOP FIVE STATES RANKED AND MAINE BY ANNUAL HUNTING-RELATED RETAIL SALES FOR ALL HUNTERS, BIG GAME HUNTERS AND NON-RESIDENT HUNTERS (Numbers in thousands of US dollars)

	Retail sales	Multiplier effect
All hunters		
Texas	1,761,285	3,636,484
Pennsylvania	1,165,059	2,275,366
Wisconsin	960,104	1,770,420
New York	891,031	1,529,508
Alabama	799,303	1,576,405
Maine	196,652	325,627
Big game hunters		
Texas	989,041	2,019,154
Wisconsin	534,981	925,777
New York	523,449	901,835
Pennsylvania	500,957	986,432
Alabama	498,972	957,938
Maine	98,155	160,046
Non-resident hunters		
Pennsylvania	269,277	488,494
Wisconsin	265,819	503,281
Colorado	227,730	451,196
Texas	156,752	318,400
Arkansas	144,380	251,710
Maine	50,312	86,003

Source: International Association of Fish and Wildlife Agencies (2002)

MOOSE HUNTING IN THE STATE OF MAINE

According to the Maine State Office of Tourism (2004), tourists visiting Maine in 2003 spent an estimated \$9.4 billion on goods, and services; (including fishing, hunting, wildlife viewing, whitewater rafting, etc.) and employed over 122,000 people. Specifically, several thousand of these people (Roper et al. 1992) have full-time jobs that cater solely to these tourists (anglers, hunters, and wildlife watchers) and are directly dependent on Maine's nature and wildlife.

According to Boyle, Reiling, Teisl and Phillips (1990), estimated annual economic value for wildlife-related activities in Maine breaks down as follows:

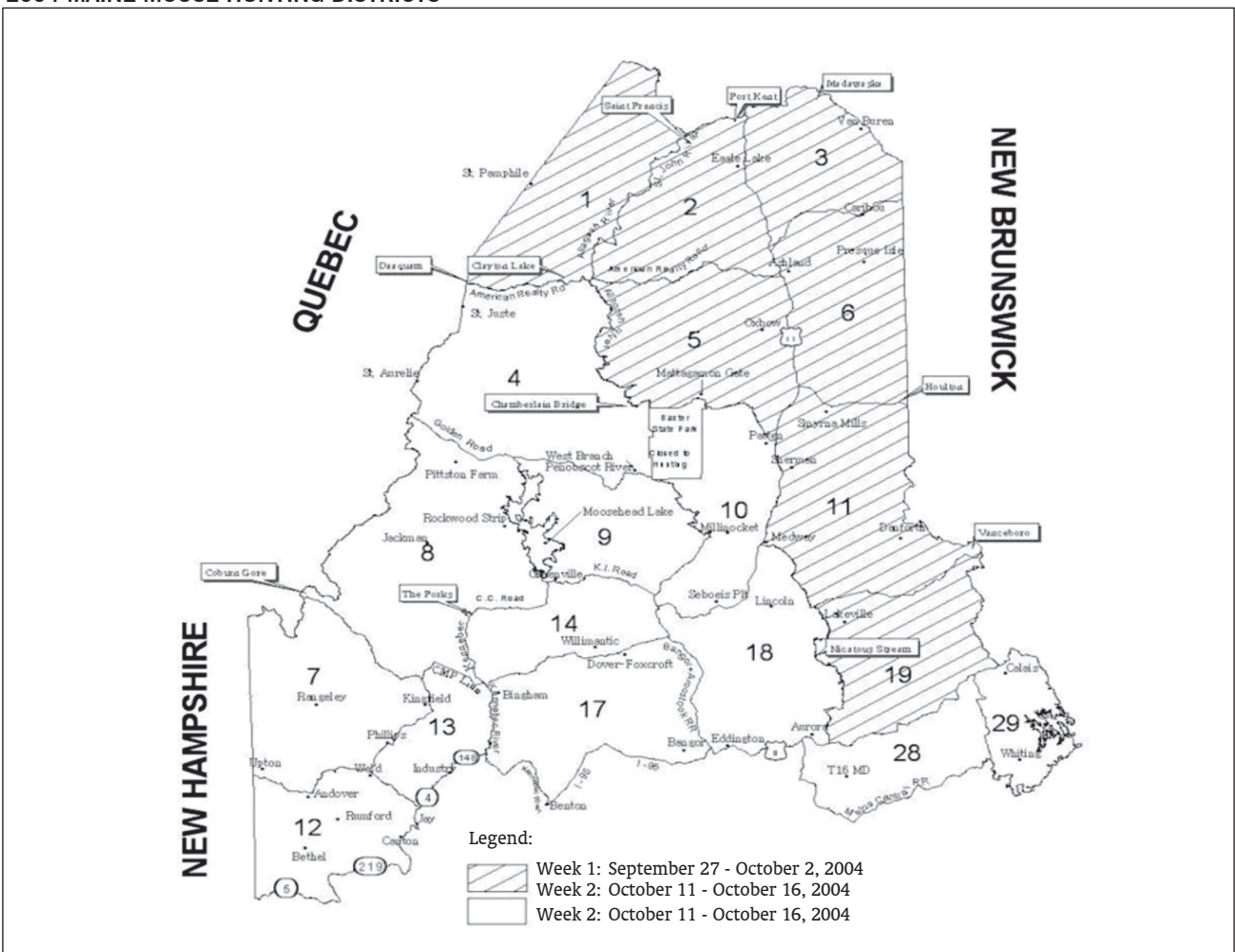
- Inland fishing \$300.7 - \$494.2 million
- Marine Sport Fishing \$135.4 - \$274.5 million
- Hunting \$183 - \$291 million
- Trapping \$1.5 - \$3.4 million
(residents only)
- Non-consumptive uses \$55.4 million
(residents only)
- TOTAL: \$676 million - \$1.1 billion

Furthermore, according to the Maine Audubon Society (1997), natural resources are the backbone of Maine's economy. Maine's ability to plan for a sustainable future requires a thorough understanding of the many different ways in which Maine's natural resources contribute to the state's economy.

One of these activities is moose hunting, which is important since it is unique to Maine and is readily accessible. The importance of moose hunting for Maine is reflected in studies by Boyle and Clark (1993) and Boyle, Reiling, and Phillips (1989) which report on moose hunter's profiles, and expenditures. They mention that residents and non-residents alike have an important impact on the state's economy as a whole.

As stated by the Maine Department of Inland Fisheries and Wildlife (MDIFW 2004), moose is a very important part of the state history and culture. It is represented on the state seal and has been part of the lives of Mainers for several hundred years. However, the number of moose had dramatically declined from colonisation days in the 1600s to the early 1900s; reasons which might include: loss of habitat, disease, unregulated hunting, etc. The management of species became more important, which led to the development of moose hunting regulations in the state of Maine.

Figure 1
2004 MAINE MOOSE HUNTING DISTRICTS



Source: Maine Department of Inland Fisheries and Wildlife.

Early in the 20th century (1935), moose hunting was banned to help reduce the decline in the numbers of the moose herd. This moratorium was upheld until the 1980s, when gradually, and very methodically, moose hunting was brought back to the state, but not without controversy. Presently, there are approximately 3,000 permits issued randomly from over 90,000 applications. The management of the moose hunt was granted by the Maine legislature to the Maine Department of Inland Fisheries and Wildlife in 1999.

The moose hunt is now broken down into two distinct seasons of one week each, with permits being issued by district (see Figure 1) depending on the moose population, hunting opportunities, and viewing opportunities. This approach has allowed the moose population to be effectively managed and has allowed hunting in areas that had not seen hunting in several decades.

Moose hunting can be done using a variety of approaches. First, several tools may be used to hunt moose. However, rifles, bows and muzzleloaders are the tools of choice for moose hunting and techniques such as water hunts, walking and stalking, blinds and tree stands are most widely used.

Regardless of the techniques and history of moose hunting, it is an important part of life in Maine today. To be able to better understand its situation today, a survey was developed to examine the experiences, opinions, and attitudes of Maine moose hunters. The information gathered from this survey will help in designing practical management strategies to address concerns of Maine moose hunters, to benefit moose populations and the Maine economy. The study developed and described: (1) Socio-demographic profile; (2) Hunter needs; (3) Moose hunting activity and success; (4) Participation motivations; (5) Satisfaction with experience; (6) Strengths and weaknesses of non-resident moose hunting in Maine.

METHODOLOGY

Survey instrument

The research process for this study is based on Dillman (1978) and Abbey-Livingstone and Abbey (1982). This study of non-resident moose hunters in the state of Maine is part of a bigger study which examined all moose hunters in that state. A questionnaire was developed to ask hunters to respond to a variety of topics relating to their hunting experience, methods, and

attitudes on topics relating to moose hunting. Hunters were also asked about their opinions on the Maine Department of Inland Fisheries and Wildlife programs and management strategies. The questionnaire contained more than 100 variables or elements of information and was divided into five parts:

- Section one was designed to collect information on the moose hunting experience in Maine, including the total number of days and dates that included moose hunting in 2004. In addition, this section asked about hunters' guiding preferences and harvesting information.
- Section two contained questions that would be used to determine moose hunters' attitudes, motivations, perceptions and habits towards moose hunting in Maine.
- Section three was designed to collect information that could be used to estimate the perceptions and attitudes of Maine moose hunters with regard to the Maine Department of Inland Fisheries and Wildlife's policies, programs and services.
- Section four was designed to collect information on money spent on moose hunting in the state of Maine. Specifically, the questions addressed amount spent on equipment, travel, food, lodging and preparation.
- Section five included questions for collecting demographic information on moose hunters, including state or country of permanent residence, age, gender, education level, race, years of hunting experience and income.

Sampling frame

For the entire study, two samples were drawn from a list of all the 2004 Maine moose hunters that was provided by the state of Maine. The first was created from the resident Maine moose hunters and the second from the non-resident Maine moose hunters. For the purpose of this analysis, the sample of non-residents is the one in which we are interested. The sample was randomly drawn from the names of hunters that were drawn in the 2004 Maine moose license lottery. These numbers in the sample were evaluated in order to obtain estimates that would be accurate to proportions of 5% with a confidence level of 95%.

In order for the sample to be representative of the Maine moose non-resident hunting population, 164 respondents were required. While taking into account the expected response rate of about 50%, people having moved, incorrect addresses, and so on, the author estimated that to obtain the necessary number of responses, 320 surveys needed to be mailed out. Since the population of non-resident moose hunters was less than 320, the questionnaire was sent out to the whole population (296 hunters).

Data collection and analysis

Each hunter was sent a packet containing a questionnaire, cover letter, implied consent form and a prepaid return envelope. Four weeks after the initial mailing, a reminder postcard was sent to all non-respondents. After a period of 6 weeks, a second packet was sent to all hunters who had not responded to the first and second mailings. Each questionnaire was given an identification number, which corresponded to a hunter's name. This number was used to assist with data entry, confidentiality and mailings.

Completed surveys were returned to the University of Maine at Presque Isle where the researchers sorted and logged them into a computer database. The researchers then keypunched survey responses into a customized Microsoft Excel spreadsheet and SPSS.

After the completion of data entry, it was verified and edited in a master database, which consisted of checking each variable's frequency distribution for out-of-range or extreme values and identifying inconsistencies in the response record (e.g., skip instructions not followed, multiple answers to single-answer questions). Identified keying errors and other inconsistencies were corrected where possible by examining the returned questionnaire.

With a response of 204 for non-resident Maine moose hunters, this provides results with a margin of error of +/- 4.66, with a confidence level of 95%.

RESULTS

Socio-demographics characteristics

As stated in Table 6, most out-of-state hunters who responded were male (97%). However, this is not necessarily an accurate number of actual women out in the field participating in this activity.

Table 6
SOCIO-DEMOGRAPHIC CHARACTERISTICS FOR MAINE
NON-RESIDENT MOOSE HUNTERS

Demographics	Number	%*
Gender		
Male	194	97
Female	6	3
Age Group		
18-29	12	6
30-39	31	16
40-49	59	30
50-59	50	25
60-69	33	17
70 and older	15	8
Education		
Elementary school	1	1
Some high school	10	5
High school degree	63	32
Vocational or technical degree	12	6
Some college	42	21
College degree	47	24
Post graduate study	21	11
Other (Military, Doctorate and Masters, G.E.D.)	2	1
Household Income		
Less than \$10,000	0	0
\$10,000-19,999	4	2
\$20,000-24,999	4	2
\$25,000-29,999	5	3
\$30,000-34,999	6	4
\$35,000-39,999	10	6
\$40,000-49,999	18	11
\$50,000-74,999	36	21
\$75,000-99,999	36	21
\$100,000 or more	51	30
Ethnic Background		
White, not of Hispanic origin	192	97
Black, not of Hispanic origin	1	0.5
Native American	2	1
Asian	2	1
Hispanic	0	0
Pacific Islander	0	0
Other *	1	0.5
Type of Area		
A city of 1,000,000 or more people	9	5
A city of 250,000 to 999,999 people	10	5
A city of 50,000 to 249,999 people	21	11
A city or town with less than 50,000 people	64	32
A rural area	95	48

* Percentages may not sum to 100% due to rounding.

Based on the written comments, the number is actually a little higher. Some of these responses indicated that females were more likely to be sub-permittees who did not hunt. But, according to Hunting Laws and Regulations in Maine, both the permittee and the sub-permittee must "physically be in the presence of each other while hunting, without the aid of radios or similar devices. The permittee may hunt alone, but if they hunt together they must be in contact. The sub-permittee may not hunt alone" (MDIFW 2004). Whether females are hunting or not, they are in the field.

Table 7
DISTRIBUTION OF MAINE NON-RESIDENT MOOSE HUNTERS ACCORDING TO THEIR STATE OF RESIDENCE

State/ Province of residence	Number	%*
Pennsylvania	35	17.0
Massachusetts	31	15.0
New York	26	13.0
Connecticut	15	7.0
Vermont	14	7.0
New Jersey	12	6.0
New Hampshire	12	6.0
Michigan	10	5.0
Ohio	6	3.0
Rhode Island	6	3.0
Maryland	4	2.0
Georgia	3	1.0
Illinois	3	1.0
North Carolina	3	1.0
Virginia	3	1.0
Delaware	2	1.0
Florida	2	1.0
Missouri	2	1.0
Tennessee	2	1.0
Alabama	1	0.5
California	1	0.5
Colorado	1	0.5
Kentucky	1	0.5
Minnesota	1	0.5
Quebec	1	0.5
South Carolina	1	0.5
South Dakota	1	0.5
Texas	1	0.5
Wisconsin	1	0.5
All States/Province	201	100.0

* Percentages may not sum to 100% due to rounding.

The highest percentages (76%) of non-resident hunters were in the age group of 35 to 64 years (Table 6). There were slightly more older hunters (over 65) compared to the younger hunters (under 35). The lowest numbers of non-resident hunters were in the youngest and highest age groups. Each group represented 2% of the total. The highest number of hunters (14%) was in the age group 45 to 49.

According to Table 7, 32% of non-resident moose hunters have at least a high school education. Furthermore, 45% of non-residents indicated that they reported either having some college education or a college degree. Post-graduate level of study was reported at 11%.

There were no non-resident hunters with incomes below \$10,000. The non-residents' income was mainly above \$40,000. Seventy-two percent (72%) of non-residents reported an annual income before taxes of over \$50,000 and 30% of those were over \$100,000.

The ethnic background of Maine Moose Hunters was 97% Caucasian, not of Hispanic origin. There was a mixed reporting of other backgrounds, but the numbers were very small.

Non-resident hunters came mostly from rural areas. The numbers demonstrated that hunters from larger population areas were less likely to come to Maine to hunt moose. Hunters from cities with less than 50,000 represented 80% of the non-residents (Table 1). Non-residents hunters from cities under 250,000 in population, were represented by 91%.

More than half (52%) of the non-resident hunters were located in the Northeastern part of the United States. A quarter (26%) came from the Mid-Atlantic States, with the Mid-West providing 12%, the South 8% and 3% from the West. Surprisingly, less than 1% (1 person) came from Canada which is in the neighboring jurisdiction (Table 7).

Maine moose hunting experience

Nearly 30% (Table 8) of non-residents reported 41 or more years of hunting experience. However, most non-resident moose hunters have not had much experience moose hunting. A high percentage (87%) reported having 5 years or less of experience hunting moose.

Table 8
**HUNTING EXPERIENCE OF MAINE
 NON-RESIDENT MOOSE HUNTERS**

Hunting experience	Number	%*
Hunting experience		
1 to 5 years	2	1
6 to 10 years	3	1
11 to 15 years	7	3
16 to 20 years	17	9
21 to 25 years	25	13
26 to 30 years	32	16
31 to 35 years	23	12
36 to 40 years	30	15
41 years and more	59	30
Moose hunting experience		
1 to 5 years	173	87
6 to 10 years	13	7
11 to 15 years	7	3
16 years and more	5	2
Age started hunting		
10 years old or less	47	24
11 to 20 years old	132	66
21 to 30 years old	16	8
31 years old and more	4	2

* Percentages may not sum to 100% due to rounding.

Table 9
**HUNTING EFFORT OF MAINE
 NON-RESIDENT MOOSE HUNTERS IN 2004**

Days	Non-residents	
	Number	%*
Week 1		
Monday, September 27	73	36
Tuesday, September 28	55	27
Wednesday, September 29	38	19
Thursday, September 30	23	11
Friday, October 1	9	4
Saturday, October 2	4	2
Week 1 SUB-TOTAL	202	100
Week 2		
Monday, October 11	126	31
Tuesday, October 12	98	24
Wednesday, October 13	75	18
Thursday, October 14	55	13
Friday, October 15	38	9
Saturday, October 16	19	5
Week 1 SUB-TOTAL	411	100
TOTAL	613	

* Percentages may not sum to 100% due to rounding.

As stated in Table 9, the majority of moose hunters hunted in the first part of the week (first two days). By the third day, the percentages of people hunting dropped dramatically and only those who had not yet harvested their moose continued to go out.

A majority of hunters (85%) who completed the survey were successful in harvesting a moose, while 15% were not. This and other characteristics of non-resident moose hunters' experience are presented in Table 10.

Table 10
**MOOSE HUNTING EXPERIENCE OF MAINE
 NON-RESIDENT MOOSE HUNTERS**

Experience	Non-residents	
	Number	%
Harvest		
No moose harvested	30	15
Moose harvested	172	85
TOTAL	202	100
Type of land		
Private land	99	50
Public land	66	33
Private and public land	21	10
Did not know	15	7
TOTAL	201	100
Guide used		
Maine guide	133	65
Friend	17	8
Family	8	4
Other (husband, license holder is a guide)	4	2
None	42	21
TOTAL	204	100
Satisfaction		
Satisfied to very satisfied	131	83
Neutral	6	4
Unsatisfied to very unsatisfied	21	13
TOTAL	158	100
Moose passed before harvesting		
No moose	75	42
One moose	24	13
Two moose	23	13
Three moose	19	11
More than three moose**	39	22
TOTAL	180	100

**Up to 23 moose.

Nearly 50% of hunters hunted on private land and 33% on public land. It was somewhat surprising that 7% of the hunters reported not knowing whether the land they hunted on was private or public land. Approximately 10% of hunters hunted both on public and private land.

Sixty-six percent of non-resident hunters used a guide. Furthermore, these hunters who reported (Table 14) using a guide were "satisfied to very satisfied", 83% of the time. However, thirteen percent (13%) were "unsatisfied to very unsatisfied." This number is also consistent with the non-success rate.

A significant number (42%) of all moose hunters harvested the first moose that they saw. However, several hunters passed on animals hoping to harvest a

different individual. This is surprising considering the difficulty of the activity and the lottery system, where individuals could be several years before having another chance at hunting moose. However, it is also a statement of the health of the moose herd and industry in Maine; hunters are confident enough to pick and choose. Some hunters let 10 or more animals (a high of 23) go by before harvesting an animal.

The criteria for location selection, in order of priority are, no over-crowding, an abundance of moose, an excellent opportunity to harvest, an easily accessible area, and cleanliness (Table 11).

When asked to rate the overall experience of moose hunting in Maine (Table 12), hunters were "very satisfied to satisfied" (89%) with the experience.

Table 11
RELATIVE IMPORTANCE GIVEN TO DIFFERENT CRITERIA WITH REGARD TO THE CHOICE OF HUNTING LOCATION FOR NON-RESIDENT MOOSE HUNTERS (%)

Criteria	Importance Given to Different Criteria				
	Very unimportant	Somewhat unimportant	Neutral	Somewhat important	Very important
(a) Hunting area accessibility	3.6	8.7	7.2	29.2	51.3
(b) Not having to travel far	25.4	20.2	23.3	23.8	7.3
(c) If the area is not crowded	2.1	1.0	5.2	29.8	61.8
(d) If the area has an abundance of moose	1.5	2.1	3.1	38.5	54.9
(e) Availability of guiding service	21.6	7.2	17.0	30.9	23.2
(f) If the area has large moose	5.6	7.2	24.1	40.5	22.6
(g) The natural beauty of the area	6.2	5.1	21.5	41.0	26.2
(h) Opportunities to view wildlife	3.6	3.1	9.7	47.7	35.9
(i) Familiarity with the area	13.8	12.8	36.4	26.2	10.8
(j) Service facilities available	16.6	11.4	29.0	34.2	8.8
(k) The opportunities for other recreation activities	17.8	15.2	29.8	26.7	10.5
(l) Availability of equipment rental at hunting site	33.7	25.3	24.7	10.5	5.8
(m) Having specific information about a particular location	8.2	7.2	20.1	37.1	27.3
(n) If the area is clean (litter-free)	4.1	2.6	14.0	31.6	47.7
(o) If the area provides an excellent opportunity to harvest a moose	0.5	2.1	4.1	35.2	58.0

Table 12
**MAINE NON-RESIDENT MOOSE HUNTERS
 SATISFACTION WITH MOOSE HUNTING EXPERIENCE**

Satisfaction	Non-residents	
	Number	%*
Very unsatisfied to satisfied	11	5.0
Neutral	11	5.0
Satisfied to very satisfied	177	89.0
TOTAL	199	100.0

* Percentages may not sum to 100% due to rounding.

Reasons for participation

As stated in Table 13, the first priority was to experience the hunt. Second was to be outdoors, followed by experiencing adventure and excitement and the experience of new and different things.

Table 13
**RELATIVE IMPORTANCE GIVEN TO DIFFERENT CRITERIA WITH REGARD TO THE REASON
 FOR PRACTICING MOOSE HUNTING FOR NON-RESIDENT MAINE MOOSE HUNTERS**

Reason	Importance Given to Different Reasons				
	Very unimportant	Somewhat unimportant	Neutral	Somewhat important	Very important
(a) To be outdoors	7.6	1.0	5.6	15.7	70.2
(b) For family recreation	9.0	7.9	24.9	25.4	32.8
(c) To experience new and different things	8.8	1.6	8.3	26.4	54.9
(d) For relaxation	7.2	3.1	13.3	29.2	47.2
(e) To obtain a moose for eating	6.2	7.2	11.3	32.3	43.1
(f) For the experience of the hunt	6.6	2.0	1.0	12.6	77.8
(g) To test my equipment	27.6	15.1	34.9	13.5	8.9
(h) To be with friends	8.6	3.0	11.7	28.9	47.7
(i) To develop my hunting skills	12.4	8.8	22.3	31.1	25.4
(j) To get away from the regular routine	8.7	4.1	14.3	28.1	44.9
(k) To catch a trophy moose	13.8	9.2	21.9	23.5	31.6
(l) For the challenge/sport	5.6	4.1	11.2	26.4	52.8
(m) To experience adventure and excitement	6.2	3.1	6.2	26.3	58.2
(n) To share my knowledge of hunting with others	9.7	10.3	29.7	24.6	25.6
(o) For physical exercise	11.8	9.2	29.2	30.3	19.5
(p) Other*	13.3	3.3	20.0	0.0	63.3

* Hunt of a lifetime, Be a moose master, Love of the hunt, Great guide, Be in Maine in the Fall, Fun, Time with daughter, Experience hunt with father and sons, Love hunting, Fellowship, Photo Opportunities, To maintain an honest place in the cycle of life, Great Opportunity, Relax, Excitement, Return to hunt moose in my home state.

Other criteria of significance for non-residents were the challenge of the activity and being with family and friends (social aspect).

The majority of moose hunters (Table 14) feel that harvesting a moose makes a successful trip, however that is not the only reason. Most hunters feel that the experience of hunting can be rewarding regardless of whether or not they come home with a moose. Furthermore, most hunters agree that the size of the moose does not matter.

The experience itself can be rewarding and harvesting a moose is only an added bonus. Hence, even though harvesting a moose is not the only reward, it is important to the moose hunter that there be a good opportunity to harvest.

Table 14

MAINE NON-RESIDENT MOOSE HUNTERS BELIEFS

(%)

Hunters	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Maine non-resident moose hunters believe:					
• “A successful hunting trip is one in which I harvest a moose”	12.1	21.2	15.7	30.3	20.7
• “Harvesting a trophy moose is the biggest reward to me”	11.7	23.5	25.5	22.4	16.8
• “A moose hunting trip can be successful even if I do not harvest a moose”	3.6	9.6	11.7	38.6	36.5
• “Bringing the moose home to the table is an important outcome of hunting”	5.1	5.1	24.2	38.9	26.8
• “The bigger the moose I harvest, the better the hunting trip”	20.3	27.9	25.4	16.2	10.2
• “I like to hunt where there is an excellent opportunity to harvest a moose”	1.0	2.0	5.5	41.7	49.7

Planning of the moose hunting trip

The result concerning the sources of information with regard to Maine moose hunting showed that the largest percentage of hunters consulted friends or other hunters for information (Table 15).

The Maine Moose Hunter's Guide provided by the MDIFW was used by a large number of hunters and the MDIFW Web site was also an important source of information. Sporting goods stores were also important, as were newspapers and commercial magazines/newsletters.

Table 15

NON-RESIDENT MAINE MOOSE HUNTERS SOURCES OF INFORMATION WITH REGARD TO MAINE MOOSE HUNTING

(%)

Sources of information	Never	Rarely	Occasionally	Often	Always
(a) Maine Moose Hunter's Guide provided by the MDIFW	11.9	9.3	29.4	24.7	24.7
(b) Other MDIFW publications, handouts and news releases	14.7	14.1	41.4	17.3	12.6
(c) MDIFW worldwide web page (internet)	22.8	7.8	17.6	30.6	21.2
(d) MDIFW staff	32.4	26.6	23.4	11.2	6.4
(e) Newspapers	40.8	23.4	21.7	9.2	4.9
(f) Commercial magazines or newsletters	23.9	22.3	29.3	17.6	6.9
(g) Television	54.0	27.0	11.1	5.8	2.1
(h) Radio	61.4	25.4	7.9	3.2	2.1
(i) Friends or other hunters	6.8	5.8	28.9	35.8	22.6
(j) Sporting goods stores	27.3	16.6	33.2	19.3	3.7
(k) Equipment dealers	40.6	23.5	23.5	10.7	1.6
(l) Hunting club	50.0	21.6	15.3	11.1	2.1
(m) Other*	34.3	2.9	8.6	11.4	42.9

* Guide, Own observations, Local residents, Maps, Northwoods Journal Maine Sportsman, Game biologists, World wide web, Chamber of commerce, Sport shows.

DISCUSSION AND CONCLUSION

As previously stated, hunting is a very important part of the United States economy and heritage. Hunting in the state of Maine is similar to hunting in the United States. The profile of hunters does not differ greatly and the economic importance is unquestionable.

More specifically, the survey results that have been obtained have given a picture of the moose hunting experience in Maine. The information provided in this study and the data collected clearly give the indication that the state of Maine is effective in managing the moose hunt. Furthermore, it will show some tendencies and aid in further developing this industry in Maine.

The typical non-resident is a white male from the Northeast region of the country and lives mostly in rural areas. Three-quarters of them fall into the age range of 35 to 64, with the largest group being 45 to 49. They are primarily interested in the hunting experience and even if they do not harvest a moose, nearly 90% are satisfied with the overall experience of hunting moose in Maine.

The Maine moose hunting industry benefits from one of the greatest environments in which to offer such an activity in the lower 48 states. It offers a product similar to Alaska and Canada, but is readily accessible to several million people in the North-eastern part of the United States. Furthermore, it has great scenic views, wilderness areas, open space and a significant and interesting moose herd.

As previously stated in this article, hunting has an important impact with regard to economic and employment spin-offs. As stated in Boyle et al. (1990), the total economic value for the wildlife-related activities analyzed, including moose hunting, represents a minimum of \$675.7 million. Several direct and indirect jobs linked to moose hunting are created, which include: taxidermists, tanners, guides and outfitters, and sporting goods salesmen, who owe their livelihood to hunters.

Recreational moose hunting provides important sums of money annually for wildlife/ habitat restoration through programs such as the Pittman-Robertson program which is a federal excise tax (11%) on sporting arms, ammunition, and archery equipment, and a 10 percent tax on handguns (USFWS 2005).

Moose hunting may also have an ecological importance for the Maine woods. From a management stand point, it is in the long-term interests of moose and their habitats to have their annual surpluses removed through hunting and/or natural limiting factors. If the carrying capacity is exceeded the moose and the herd may be affected. This is something that was mentioned by several hunters in the survey with regard to vehicles in Maine hitting moose and they believe that hunting could be used effectively to try and control this situation.

Based on the results of this study, non-resident Maine moose hunters are predominantly white, male and over the age of 40 from rural areas. This is a phenomenon that is not restricted to moose hunting and should be of concern for many forms of hunting. Due to a variety of reasons, such as urbanization, young urban people are not introduced to hunting anymore and in the long run there needs to be an influx of new, young hunters to sustain such an activity. Not only does Maine moose hunting need to diversify its clientele, it also needs to develop programs to bring in more young hunters to ensure its future. This is particularly true with the aging of the American population.

Furthermore, the lack of public land could be a problem in the long run. Hunters do not always know if they are on private or public land. They could make private land owners uncomfortable and may even prevent moose hunters from using their land. If this becomes the case, the opportunities to hunt moose could be greatly diminished. Cooperation with these land owners will avoid some of these problems. They could also participate by offering packages and services to moose hunters.

Maine has one of the best environments in the lower 48 states in which to offer moose hunting. It has over 6,000 lakes and ponds, coupled with 32,000 miles of streams and rivers winding through expansive forests which are easily accessible: a habitat that is ideal for moose to prosper and to offer non-residents an extraordinary experience. Furthermore, this is offered within driving distance of a huge part of the American population.

Hunting is a heritage activity that has been part of America since it was first inhabited by Native Americans and then by Europeans. Because of this link to history and culture, it is an activity that is relevant to present

and future societal norms. Hunting is a respected part of the spectrum of renewable resource uses, and is both respectful of and responsible to wildlife conservation goals and objectives.

Over the last several decades (Cordell and Overdevest 2001; Cordell 1999; Environment Canada 1992; Environment Canada 1997) the number of hunters has declined in North America and more specifically in the United States. Some of the major reasons for this decline include: firearm restrictions, urbanization and loss of hunting tradition, the anti-hunting movement and society's increased concern for all wildlife species, a change in the age-sex structure of hunters, increased cost and complication of hunting, the public perception that hunting threatens game populations, and dissatisfaction with the government's ability to properly manage the game resource and all hunters.

As stated in Koppel (1991), firearms are coming under more scrutiny and are being considered for tougher rules and regulations similar to other countries. For example, Canada has adopted a firearms registration program (CFC 2005) where all firearm owners must register their firearms at a national center. The purpose of such a program (Mauser 2001) is to try and curb crime and restrict and control the distribution of firearms. However, in the long run, such a program may have a negative impact on hunting, because it will limit accessibility to firearms and consequently, restrict access to hunting. This survey illustrates this situation with only one Canadian hunting moose in Maine, since it is so difficult to cross borders with firearms.

Negative perceptions of hunting fueled by hunter actions have fuelled the anti-hunting movement and blemished the image of hunters. Certain issues such as: a lack of good hunting ethics and adequate policing of hunter behaviour; the ability to cooperatively work with other conservation groups, government, industry/business and educational institutions on important conservation/environmental issues, have fuelled some of the anti-hunting sentiment. Animal welfare proponents and the general public are concerned about pain and suffering and loss of life inflicted on hunted animals and about the motives and attitudes of hunters and how the hunter positions himself in the minds of the non-hunting public. These are important factors which need to be addressed to assure whether hunting will be tolerated, abolished or accepted as part of the American and even North American lifestyle.

As urbanization increases and fewer parents introduce their children to the tradition of hunting, a growing and more vocal anti-hunting community and the media pressure society to refrain from hunting.

Recommendations

Even if moose hunting is presently healthy, in the long-run, there is some uncertainty. As stated previously, the present non-resident moose hunter is male, white, and older. This can be a problem since this a fragile clientele that is not being renewed. Young people, non-Caucasians and women are not as prevalent in this activity as they could be. With the changing demographics of the United States: aging population, minorities becoming more prevalent and women participating in outdoor activities, the non-resident moose hunter profile will also change. It is then imperative to find out what these people want. Is it worth giving these clients a priority in the lottery process? A study targeting these potential clients would be appropriate for the future of moose hunting in Maine.

Furthermore, since close to 90,000 people apply for a moose hunting licence and only 3,000 people actually get a license. It would be interesting to determine if there could be an alternative for the people not chosen. Several people in this study have demonstrated their frustration with the process of not being chosen often enough. A study of the ones not chosen could identify activities and experiences that could generate more interest in this activity for the future.

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REFERENCES

- Abbey-Livingston D. and Abbey D. (1982) *Enjoying Research? A How-To Manual on Needs Assessment*. Queen's Printer.
- Benson J. (1994) *Background Paper: On the Economic Contribution of Maine's Natural Resource Industries. A report for the Maine State Planning Office, Augusta.*
- Boyle K. J. and Clark (1993) *Does Getting a Bull Significantly Increase Value? The Net Economic Value of Moose Hunting in Maine. Alces. 29, 201-211.*

- Boyle K. J., Reiling S. D., Teisl M. and Phillips M. (1990) *A Study of the Impact of Game and Nongame Species on Maine's Economy*. Department of Agricultural and Resource Economics. Paper no. 423. University of Maine University of Maine-Orono.
- Boyle K. J., Reiling S. D. and Phillips M. (1989) *Highlights from the Survey of 1988 Moose Hunters*. Department of Agricultural and Resource Economics, ARE 392. University of Maine, Orono.
- Canadian Firearm Centre (2005). *Fact Sheets concerning the Firearms Act*. Available from: http://www.cfc-cafc.gc.ca/info_for-reseignement/factsheets/default_e.asp. [Accessed on September 8, 2005]
- Cordell H. K. and Overdevst C. (2001) *Footprints on the Land: An Assessment of Demographic Trends and the Future of Natural Lands in the United States*. Sagamore Publishing.
- Cordell H. K. (1999) *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends*. Sagamore Publishing.
- Dillmore D. A. (1978) *Mail and Telephone Surveys: The Total Design Method*. John Wiley and Sons, Inc.
- Environment Canada (1992) *The importance of wildlife to Canadians: Highlights of the 1991 survey*. Available from: <http://www.ec.gc.ca/nature/highlights/high.htm>. [Accessed on September 8, 2005]
- Environment Canada (1997) *The importance of nature to Canadians: Highlights of the 1996 survey*. Available from: <http://www.ec.gc.ca/nature/highlights/highlite.html>. [Accessed on September 8, 2005]
- International Association of Fish and Wildlife Agencies (IAFWA) (2002) *Economic importance of hunting in America*. Available from: http://www.iafwa.org/fwmr_pubs.html. [Accessed on September 16, 2006]
- Koppel D. B. (1991) *Canadian Gun Control: Should the United States Look North for a Solution to its Firearms Problem*. Available from: <http://www.guncite.com/journals/dkcg.html>. [Accessed on September 8, 2005]
- Krohn W. B., Boone R. B., Sader S. A., Hepinstall J. A., Schaefer S. M. and Painton S. L. (1999) *Maine Gap Analysis: Final Report Summary*. Available from: http://www.wle.umaine.edu/temp_unit/gap/news/gap98/gap98.html. [Accessed on September 8, 2005]
- Maine Audubon Society (1997). *Valuing the Nature of Maine*. Available from: <http://www.maineaudubon.org/bib/bib.txt>. [Accessed on September 6, 2005]
- Maine Department of Inland Fisheries and Wildlife (MDIFW) (2004) *2004 Maine Moose Hunter's Guide*. Available from: <http://mainegov.images.informe.org/ifw/pdf/moosehuntguide.pdf>. [Accessed on January 6, 2005]
- Maine State Office of Tourism. (2004) *Maine Tourism Facts: A Reference Guide to the Impact of Out-of-State Tourism on the State of Maine*. Maine Department of Economic and Community Development, Office of Tourism, Augusta.
- Mauser G. (2001) *Misfire: Firearm Registration in Canada*. Available from: <http://www.fraserinstitute.ca/admin/books/files/firearm-registry.pdf>. [Accessed on September 6, 2005]
- Roper R. K., Boyle K. J. and Reiling S. D. (1992) *The Economic Impact of Fishing, Hunting, and Wildlife Observation on Maine's Economy*. *Maine Business Indicators*, 37 (3), 1-3.
- U.S. Fish and Wildlife Service (USFWS) (2005) *Federal Aid*. In: *Wildlife Restoration – Pittman Robertson*. Available from: <http://federalaid.fws.gov/wr/fawr.html>. [Accessed on September 8, 2005]
- U.S. Fish and Wildlife Service (USFWS) (2002) *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. <http://www.census.gov/prod/2002pubs/FHW01.pdf>. [Accessed on September 14, 2006]

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