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Hunter and Angler Expenditures, Characteristics, and Economic Effects, North Dakota, 2011-2012

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The characteristics and expenditures of hunters and anglers in North Dakota have been periodically assessed since the 1970s. Since 1978, seven studies have been conducted at approximately five-year intervals to assess socio-economic characteristics of both resident and nonresident hunters and anglers. This report represents the latest estimations of the economic effects of hunting and fishing on the state economy. The purpose of this study was to estimate the characteristics, expenditures, and economic effects of hunters and anglers in North Dakota during the 2011-2012 season, and compare current information to previous studies to identify trends in hunting and fishing activities.

Methods

The North Dakota Game and Fish Department conducted a mail survey of hunters and anglers in the summer of 2012 to solicit information on hunting and angling expenditures during the 2011-2012 season. A random sample of licensed hunters and anglers were mailed questionnaires to solicit information on expenditures made within North Dakota for the specified activity and season. Hunting and fishing activities were divided into 18 different categories, based on license type (i.e., resident, nonresident, gratis), game type (i.e., special big game, deer, furbearers, turkey, upland, waterfowl, and fish), and, when applicable, by weapon type (i.e., archery and firearm). The survey groups represented most of the hunting and angling activities in North Dakota during 2011-2012 seasons. A total of 22,664 resident hunters and anglers and 8,480 nonresident hunters and anglers were sampled. Across all hunting and fishing categories, 10,541 individuals responded to the survey and 474 mailings were undeliverable, resulting in an overall response rate of 34 percent.

The number and type of hunting and fishing activities surveyed in 2012 were similar to previous studies. Resident and nonresident antelope hunters were not surveyed because there was no season in 2011.

Several statistical methods were used to examine for data outliers. Expenditures were also evaluated by considering days participated, miles traveled, and/or other qualifying data to eliminate outliers that could not be considered defendable or reasonable. For example, $5000 for ammunition for one day of hunting or $2000 for food expense for two days of hunting would be considered unreasonable levels of spending.

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Hunter and Angler Characteristics

Age, residence, income, gender, days participated, miles traveled, and other characteristics were solicited from survey participants. Resident and nonresident hunters and anglers participated about the same number of days and traveled the same distances as they did in the mid 1990s and early 2000s. Resident hunters and anglers continue to spend more time hunting and fishing in the state than nonresidents. Gross household incomes of nonresidents remain higher than residents. Recent changes in characteristics of hunters and anglers included a substantial increase in gross household incomes for both resident and nonresident participants and an increase in the percentage of resident hunters and anglers living in urban communities.

Residents

Averaged across all resident hunting categories, the typical resident hunter was male, 44 years old, hunted 7 days per year in North Dakota, lived in a community over 2,500 in population, had a gross income over $50,000, and primarily hunted on private land. The typical resident angler was male, 47 years old, fished 16 days per year in the state, lived in an urban community, and had a gross income over $50,000.

Nonresidents

Averaged across all nonresident hunting categories, the typical nonresident hunter was male, 46 years old, hunted 5 days per year in North Dakota, lived in a community with a population of 2,500 or more, had a gross income around $70,000, and primarily hunted on private land. The typical nonresident angler was male, 50 years old, fished 9 days per year in the state, lived in an urban community, and had a gross income around $75,000.

Hunter and Angler Expenditures

An *economic contribution* analysis was conducted to measure all revenues associated with hunting and fishing in North Dakota, even if not all of the economic activity represented new wealth to the state. Economic effects of a project, program, policy, or activity can be categorized into direct and secondary impacts. Direct impacts are those changes in economic output, employment, or income that represent the initial or first effects of a project, program, or event. In this study, direct effects were the sum of all resident and nonresident hunting and fishing expenditures. Secondary impacts (sometimes categorized as indirect or induced effects) result from subsequent rounds of spending and respending within the economy, and are sometimes referred to as multiplier effects. The gross business volume (total economic effects) from hunting and fishing activities is a combination of direct and secondary effects.

Average Season Expenditures

Average expenditures for hunting and fishing participants in North Dakota were estimated for variable (nondurable goods/services), fixed (durable goods), and total (durable and nondurable goods/services) expenses. Nondurable goods represent items/services consumed or used in direct proportion to activity levels (e.g., lodging, food, gas, ammunition). Durable goods usually represent items that can be used over several seasons or can be

used numerous times over extended periods before replacing (e.g., clothing, weapons, decoys, boats).

Turkey hunters had the lowest average total season expenditures of all the groups examined (Table 1). Total season expenditures for fall and spring turkey were on average about $230 and $211, respectively. Total season expenditures for resident firearm deer and nonresident firearm deer hunters were $585 and $791, respectively. Resident archery deer and nonresident archery deer hunters spent on average $1,214 and $964 per season, respectively (Table 1). Special big game hunters had average total season expenditures of $1,200.

Resident upland game and waterfowl hunters had total season expenditures of $770 and $898, respectively. Nonresident small game hunters, which included spending for both upland and waterfowl hunting activities, averaged $1,001 per season. Given the limitations with survey methods and licensing data, an estimate of average total season spending for resident small game hunters (upland game and waterfowl combined) could not be developed. Thus, average spending for resident upland game and resident waterfowl hunters cannot be compared to nonresident spending.

Resident open water anglers spent about $3,020 per season (Table 1). Average total season expenditures for resident ice fishing participants were $682. Residents participating in darkhouse spearing had $421 in average season expenditures. Nonresident anglers spent an average of $844 per year for open water and ice fishing activities (Table 1).

Average Daily Expenditures

Average daily expenditures were estimated by dividing total season spending by the number of participation days. Due to differences in season lengths, harvest opportunities, and typical activities required for some types of hunting/fishing, average daily expenditures can be useful in providing a relative measure of spending among activities.

Nonresident firearm deer hunters had the highest daily expenditures, averaging $226, followed by nonresident small game and resident special big game hunters with average daily expenditures of $192 and $191, respectively (Table 1). Nonresident archery and resident firearm deer hunters spent on average $130 and $136 per day, respectively, compared to $116 per day for resident archery deer hunters.

Resident hunters pursuing only upland game spent about $98 per day, while resident hunters pursuing only waterfowl spent $111 per day. Fall and spring turkey hunters had average daily expenditures of $66 and $70, respectively (Table 1). Resident furbearer hunters had the lowest average daily expenditures of all hunting activities ($64).

Average daily expenditures for resident open water fishing was $178, compared to $127 for nonresidents. Darkhouse spearing had the lowest average daily expenditures ($55) of all fishing categories. Resident ice fishing participants had average daily expenditures of $76.

Table 1. Average Season and Daily Expenditures, by Activity, North Dakota, 2011-2012

Residence/Activity	Average Season Expenditures			Days[a]	Average Daily Expenditures[b]		
	Variable	Fixed	Total		Variable	Fixed	Total
	---------- $ ----------				---------- $ ----------		
Resident							
Deer							
Archery	615.49	598.64	1,214.13	11	58.62	57.01	115.63
Firearm	406.64	177.94	584.58	4	94.57	41.38	135.95
Gratis	298.96	144.41	433.37	6	54.36	26.26	80.62
Muzzleloader	246.47	146.54	393.01	6	44.01	26.17	70.18
Special Big Game	898.99	301.33	1,200.22	6	142.68	47.83	190.51
Furbearer	367.03	385.62	752.65	12	31.10	32.68	63.78
Small Game							
Upland	547.61	222.61	770.22	8	69.32	28.18	97.50
Waterfowl	577.81	319.79	897.60	8	71.33	39.48	110.81
Turkey							
Fall Regular	154.94	74.85	229.79	4	44.27	21.39	65.65
Spring Regular	134.58	75.97	210.55	3	44.86	25.32	70.18
Fishing							
Open Water	842.36	2,177.76	3,020.12	17	49.84	128.18	178.02
Ice	382.26	299.59	681.85	9	42.47	33.29	75.76
Darkhouse	218.48	202.15	420.63	8	28.75	26.60	55.35
Nonresident							
Deer							
Archery	825.92	138.34	964.26	7	111.61	18.69	130.30
Firearm	660.10	130.51	790.61	4	188.60	37.29	225.89
Small Game	829.96	170.59	1,000.55	5	159.61	32.81	192.41
Furbearer[c]	699.44	234.99	904.43	12	56.73	19.91	76.64
Fishing	659.16	448.60	1,107.76	9	75.77	51.56	127.33

[a] Average number of days participated per individual.
[b] Due to missing observations, average season expenditures divided by days participated will not necessarily equal average daily expenditures.
c Resident and nonresident furbearer hunters were not surveyed separately to determine the number of days hunted.

Total season expenditures for residents and nonresidents were comparable for similar activities; however, nonresidents generally spent fewer days hunting or fishing

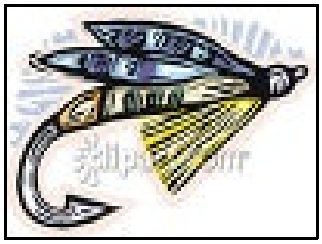
in the state than residents. As a result, daily expenditures were slightly higher for nonresidents than residents. Average daily expenditures for nonresidents were higher for lodging, meals, and other day-to-day expenses, while residents had higher average daily expenditures for equipment, clothing, gear-related expenses, and other services.

Participation Rates

The number of hunting and fishing licenses sold was provided by the North Dakota Game and Fish Department (2012). However, not everyone who purchases a license actually hunts or fishes during the season. The number of active participants was based on estimating participation rates using survey data. Participation rates vary among the various hunting and fishing categories for several reasons. Typically, licenses which are difficult to obtain (e.g., the odds of drawing a lottery special big game license are low) or those activities which require a specific license (e.g., nonresident waterfowl license) will have higher participation rates. General licenses (e.g., resident sportsman license) allow participation in many activities; however, the average individual will not necessarily participate in all activities allowed by the license. Thus, participation rates for activities allowed by general licenses will typically be lower than participation rates for other activities.

Resident special big game, firearm deer, nonresident archery and firearm deer hunting had participation rates at or above 90 percent (Table 2). Similarly, resident archery deer, gratis deer, and muzzleloader had participation rates over 85 percent. Participation rates for open water fishing were 93 percent for residents and 98 percent for nonresident fishing. The participation rate for resident waterfowl hunting was 32 percent, the lowest of all survey categories.

Open water fishing (residents) had the most participants of all hunting and fishing activities in North Dakota in 2011 with about 116,516 individuals (Table 2). When the four categories of resident deer hunting were combined, those activities collectively had 113,681 participants[2]--the second highest category. Resident small game hunting, which is comprised of upland game and waterfowl hunting, was the third highest activity with nearly 77,000 participants.[2] Nonresident small game hunting was the fourth highest activity with 39,947 participants, followed by nonresident fishing with 36,669 participants (Table 2). Individuals can participate in more than one hunting and fishing activity; however, it is impossible, for example, to only count the individual who hunted deer, upland game, and turkeys as one active participant.



[2]Active participants may not equal number of individuals, since individuals can participate in more than one activity.

Table 2. License Sales, Active Participants, and Participation Rates, Hunters and Anglers, North Dakota, 2011-2012

Activity	License Sales	Participation Rate	Active Participants[a]
		----- percent-----	
Resident			
Deer			
Archery	18,515	89	16,478
Firearm	91,935	90*	82,842
Gratis	14,789	85	12,571
Muzzleloader	2,106	85	1,790
Special Big Game	689	98	675
Furbearer	73,523	58*	42,643
Small Game			
Upland	78,715	66	51,952
Waterfowl	78,715	32	25,189
Turkey			
Fall Regular	4,708	67	3,154
Spring Regular	6,672	72	4,804
Fishing			
Open Water	125,286	93	116,516
Ice	125,286	37	46,356
Season-long	125,286	89	111,505
Darkhouse Spearing[b]	1,842	72	1,326
Nonresidents			
Deer			
Archery	2,884	98	2,826
Firearm	4,045*	90*	3,641
Furbearer	4,310	58*	2,500
Small Game	42,049	95	39,947
Fishing	38,197	96	36,669

[a] Based on the percentage of survey respondents indicating participation in each activity during 2011, and does not include participants under 16 years of age.

[b] A separate license is not required for darkhouse spearing; however, participants must comply with state fishing license requirements and register their name and address with the ND Game and Fish Department.

*Participation rates for resident and nonresident furbearer and resident and nonresident deer firearm are not separated by the ND Game and Fish Department.

Projected Total Direct Expenditures

Total hunter and angler expenditures in North Dakota are a function of the number of participants and average total season expenditures per participant. Total participants in each hunting and fishing activity were multiplied by the average season total expenditures to arrive at an estimate of total hunter and angler spending.

Total direct expenditures by hunters and anglers in North Dakota during 2011 were estimated at $634.3 million, excluding purchases of licenses (Table 3). Resident hunter and angler expenditures were $555.7 million and represented 88 percent of the total. Nonresident hunter and angler expenditures were $78.6 million and represented 12 percent of the total.

Expenditures from all hunting activities were estimated at $217.5 million (34 percent of all expenditures). Expenditures from all fishing activities were $416.8 million and accounted for 66 percent of the total (Table 3).

Small game (i.e., upland game and waterfowl) hunting accounted for 46 percent ($101.3 million) of all hunter expenditures (Table 3). Deer and furbearer hunting accounted for 39 percent ($78.7 million) and 15 percent ($34.9 million) of all hunter expenditures, respectively. Special big game and turkey hunting collectively accounted for about 1 percent of all hunter expenditures.

Nonresident expenditures associated with small game hunting were estimated at $38.4 million or about 82 percent of all nonresident hunter expenditures (Table 3).

Expenditures associated with resident open water fishing were estimated at $352.6 million, over 92 percent of total resident angler expenditures (Table 3). Collectively, ice fishing and darkhouse spearing expenditures represented about 8 percent of all resident angler spending. Expenditures for total fishing by nonresidents were estimated at $40.6 million (Table 3).

Expenditures for open water fishing generated the most spending with $393.2 million or 61 percent of all resident and nonresident hunting and angling expenditures (Table 3). Resident and nonresident small game (both upland game and waterfowl) hunting was the second largest expenditure group with $101.3 million or 16 percent of all spending. Deer hunting activities accounted for 12 percent of all expenditures.

Total Economic Effects

Total direct expenditures from all hunting and fishing activities were allocated to the North Dakota Input-Output Model to estimate secondary economic effects (i.e., multiplier effects), gross business volume (i.e., sum of direct and secondary effects in all economic sectors), secondary employment, and state-level tax revenues.

Total direct expenditures ($642.9 million) from all hunting and fishing activities in North Dakota for 2011-2012 seasons generated nearly $727 million in secondary economic effects. The gross business volume (direct and secondary economic effects) of hunting and fishing in North Dakota was estimated at $1.4 billion (Table 4).

Table 3. Total Direct Expenditures (excluding license purchases), by Hunting and Fishing Activity, Residents and Nonresidents, North Dakota, 2011-2012

	Resident		Nonresident		Total	
Activity	Total	Percent	Total	Percent	Total	Percent
	- 000s $ -		- 000s $ -		- 000s $ -	
Hunting						
Deer	72,789	43	5,867	13	78,656	12
Archery	20,959	12	2,588	6	23,537	4
Firearm	44,995	26	3,289	7	48,284	8
Gratis	6,081	4			6,081	1
Muzzeloader	754	0			754	0
Special big game	772	0	na		772	0
Turkey[a]	1,840	1	na		1,840	0
Furbearer	32,638	19	2,299	5	34,937	6
Small Game[b]	62,852	37	38,433	82	101,284	16
Upland	40,522	24	21,215	45	61,737	10
Waterfowl	22,329	13	17,218	37	39,547	6
Total	170,890	100	46,599	100	217,489	34
Fishing[c]						
Open Water	352,617	92	40,620	100	393,237	61
Ice	31,607	8	na		31,607	5
Darkhouse Spearing	587	0	na		587	0
Total	384,811	100	40,620	100	425,431	66
Total Hunting/Fishing	555,701		87,219		642,920	

Note: Percentages and totals may not add due to rounding. na = not applicable.

[a] Includes fall regular, fall gratis, spring regular, and spring gratis hunter expenditures.

[b] Resident upland game and waterfowl hunters were surveyed separately. Nonresident upland game and waterfowl hunters were surveyed as one group. The split in spending between nonresident upland game and waterfowl hunting was based on a survey question requesting the percentage of total expenses attributable to each game type.

[c] Resident open water fishing, ice fishing, and darkhouse spearing activities were surveyed separately. Nonresident anglers were surveyed as one group.

Resident and nonresident hunters spent $217.5 million on hunting activities in the state in 2011-2012, which generated an additional $258 million in secondary economic effects. Hunting activities generated $476 million in gross business volume (Table 4).

Resident and nonresident anglers spent $425 million on fishing activities in the state in 2011-2012, which generated an additional $478 million in secondary economic effects. Fishing activities generated $904 million in gross business volume (Table 4).

Resident hunters and anglers spent about $556 million in the state in 2011-2012, which generated an additional $630 million in secondary economic effects. Gross business volume from resident hunter and angler expenditures was estimated at nearly $1.2 billion (Table 4).

Nonresident hunters and anglers spent about $87 million in the state in 2011-2012, which generated an additional $107 million in secondary economic effects within the state economy. The gross business volume resulting from nonresident hunters and anglers was estimated at nearly $194 million (Table 4).

Direct expenditures and secondary economic effects from resident hunters and anglers, and nonresident hunters and anglers in 2011-2012 generated about $35 million and $5 million in state-level tax collections, respectively (Table 4).

Expenditures in Rural Areas

Hunters and anglers were asked to indicate the percentage of expenditures made in cities less than 2,500 in population (i.e., rural areas) in an attempt to better understand the distribution of hunter and angler spending within the state. Rural hunters/anglers were defined as those who lived in towns less than 2,500 in population, resided on farms, or lived in rural non-farm settings. Urban hunters/anglers were defined as those living in cities with a population of 2,500 or more.

Rural Participants

Rural deer, turkey, and furbearers hunters generally had the lowest percentage of seasonal spending in rural areas (less than 50 percent), while urban hunters had the highest percentage of seasonal spending in rural areas (77 percent). Rural resident hunters, averaged across all hunting groups, spent about 55 percent of their total season expenditures in rural areas (Table 5).

Rural resident anglers participating in open water fishing had the highest average total season spending in rural areas of all rural participants ($1,389). Rural nonresident small game hunters were second with $870 spent in rural areas, followed by rural nonresident archery deer hunters and rural nonresident furbearers with $752 and $669, respectively. Rural resident upland game and rural resident waterfowl hunters spent $439 and $539, respectively, in rural areas of the state. However, rural spending by nonresident and resident small game hunters are not directly comparable due to inclusion of expenditures for more than one hunting category in the nonresident spending estimates. Rural resident and rural nonresident firearm deer hunters spent $286 and $514 in rural areas, respectively. Rural turkey hunters spent the lowest total amount per season in rural areas ($97 for fall turkey

and $69 for spring turkey) (Table 5).

Of all resident rural participants, total expenditures in rural areas were highest for rural resident open water anglers ($59.9 million). The next highest groups were rural resident deer hunters, upland game, and waterfowl hunters with $10.4 million, $7.3 million, and $4.6 million spent in rural areas, respectively (Table 5). Rural nonresident small game hunters and anglers spent about $12.2 million and $6.7 million, respectively, in rural areas. Total rural expenditures by resident and nonresident rural hunters and anglers were estimated at $122.8 million (Table 5).

Table 4. Total Economic Contribution of Resident and Nonresident Hunting and Fishing Activities in North Dakota, 2011-2012

Activity	Resident	Nonresident	Total[a]
	---------- 000s $ ----------		
Hunting			
Direct Expenditures	170,890	46,599	217,489
Secondary Effects	198,912	59,503	258,415
Gross Business Volume	369,802	106,102	475,904
Fishing			
Direct Expenditures	384,811	40,510	425,321
Secondary Effects	430,893	47,694	478,587
Gross Business Volume	815,704	88,204	903,908
Total Hunting and Fishing			
Direct Expenditures	555,701	87,109	642,810
Secondary Effects	629,805	107,197	737,002
Gross Business Volume	1,185,506	194,306	1,379,812
Secondary Employment[b]	2,200	369	2,569
State Tax Collections[c]	34,944	5,112	40,056

[a] Totals may not add due to rounding.
[b] Secondary employment was measured as full-time equivalent jobs.
[c] State tax collections included sales and use, personal income, and corporate income taxes.

Urban Participants

Urban small game hunters generally spent the highest percentage of their season expenditures in rural areas, while urban archery deer hunters spent the lowest percentage of their season expenditures in rural areas (Table 5). Urban resident hunters, averaged across all hunting groups, spent about 77 percent of their total season expenditures in rural areas.

Urban resident open water fishing had the highest average total season spending in rural areas of all urban participants ($1,933) (Table 5). The next highest groups were urban nonresident small game hunters and resident special big game hunters with $941 and $888, respectively. Four other groups, urban resident waterfowl hunters, urban nonresident archery deer hunters, and urban resident deer hunters, all spent on average over $700 per person in rural areas. Urban resident upland game and furbearer hunters spent $678 and $504, respectively, in rural areas.

Of all urban participants, total expenditures in rural areas were highest for urban resident anglers participating in open water fishing ($142 million). The next highest groups were urban nonresident small game hunters, urban resident upland game hunters, urban resident firearm deer hunters, and urban resident ice fishing with $24.4 million, $24.0 million, $22.2 million, and $14.0 million in total expenditures in rural areas, respectively (Table 5). Total rural expenditures by resident and nonresident urban hunters and anglers were estimated at $283.9 million (Table 5).

All Participants

Rural and urban resident hunters spent about $34.6 million and $82.6 million in rural areas of North Dakota during 2011-2012 season, respectively (Table 6). Resident hunters spent about $117.2 million in rural areas of the state, or 29 percent of all rural hunting and fishing expenditures in the state.

Rural and urban resident anglers spent about $64.7 million and $156.0 million in rural areas of North Dakota during 2011, respectively (Table 6). Resident anglers spent about $220.7 million in rural areas of the state, which represented 55 percent of all rural hunting and fishing expenditures in the state. Resident hunters and anglers spent $337.9 million in rural areas, or 84 percent of all rural expenditures in 2011-2012 (Table 6).

Nonresident hunters spent $42.7 million in rural areas of the state during 2011-2012. Nonresident anglers spent $26.2 million in rural areas of the state in 2011. Nonresident hunters and anglers spent $68.9 million in rural areas, representing 16 percent of all rural expenditures in 2011-2012 (Table 6).

Total rural expenditures for resident and nonresident hunters/anglers were estimated at $406.7 million in North Dakota during 2011. Rural expenditures represented 63 percent of all expenditures in the state in 2011-2012.

Table 5. Hunter and Angler Expenditures in Rural Areas by Rural and Urban Participants, North Dakota, 2011-2012

Residence/Activity	Rural Hunters/Anglers			Urban Hunters/Anglers		
	Rural Spending per Person		Total Spending in Rural Areas	Rural Spending per Person		Total Spending in Rural Areas
Resident	- % -	-- $ --	--- $ ---	- % -	-- $ --	--- $ ---
Deer						
Archery	50	607	4,300,923	63	765	7,185,232
Firearm	49	286	10,412,253	82	479	22,194,714
Gratis	49	212	1,998,789	80	347	1,090,534
Muzzleloader	47	184	184,442	77	303	238,643
Special Big Game	53	636	210,357	74	888	305,694
Furbearer	46	346	5,311,612	67	504	13,754,926
Small Game						
Upland	57	439	7,298,217	88	678	23,951,950
Waterfowl	60	539	4,616,136	88	790	13,133,545
Turkey						
Fall	42	97	134,613	78	179	316,157
Spring	33	69	142,535	69	145	397,051
Fishing						
Open Water	46	1,389	59,881,068	64	1,933	141,892,020
Ice	39	266	4,685,664	71	484	13,910,508
Darkhouse Spearing	50	210	155,938	76	320	186,701
Nonresident						
Deer						
Archery	78	752	1,083,828	77	742	1,027,477
Firearm	65	514	580,157	75	593	1,489,788
Small Game	87	870	12,163,862	94	941	24,433,583
Furbearer	74	669	852,975	94	850	1,041,250
Fishing	57	631	8,792,493	69	765	17,392,107
Total, all groups	55[a]	na	122,805,860	77[a]	na	283,941,879

Note: Average rural spending was rounded to the nearest dollar.
[a] Simple average and does not reflect weighting by dollar volume or number of participants.
na=not applicable

Comparison of Spending in 2001 and 2011

Average season expenditures, total direct expenditures, and statewide economic effects from hunter and angler expenditures in 2011 were compared to those in 2001. Data from Bangsund and Leistritz (2003) was used to generate expenditure estimates for hunting and fishing survey groups using the same methods employed in this study.

Season Expenditures

Overall, average season expenditures in 8 of the 15 survey groups increased from 2001-02 to 2011-12 (Table 7). Average per participant spending in the remaining 7 groups decreased during the 2011-12 season compared to the 2001-02 season.

Resident deer hunters, as a group, had increases in average season spending over the period. Resident small game hunters had decreases in average spending over the period. Resident anglers increased their average season spending over the period; however, resident ice and darkhouse anglers decreased their average season spending along with nonresident fishing. Nonresident archery deer hunters had the largest decrease of any category.

Compared to spending in the 2001-02 season, after adjusting for inflation, average season expenditures for resident deer hunters increased in the 2011-12 season (Table 7). Open water fishing spending increased nearly 17 percent while both ice fishing and darkhouse spearing decreased for resident anglers.

Resident archery deer and firearm deer hunters increased their average season spending by 51 percent and 7 percent from 2001-02 to 2011-12, respectively (Table 7). Resident furbearer and special big game hunters had a modest 4 percent and 2 percent increase, respectively.

Resident upland game and waterfowl hunters spent on average 16 percent and 13 percent less in 2011-12 than in 2001-02, respectively (Table 7). Fall turkey hunters spent 25 percent less in 2011 compared to 2001. Nonresident archery deer hunters posted declines in average season spending of 35 percent between 2001-02 and 2011-12 (Table 7). However, nonresident firearm deer hunters increased their average season spending by 27 percent over the period. Nonresident anglers spent 1 percent less per person during 2011 than in the 2001. Nonresident small game hunters in the 2011-12 season increased their average spending by 3 percent over 2001-02 season spending levels.

Table 6. Hunter and Angler Expenditures in Rural Areas, All Participants, North Dakota, 2011-2012

Group	Participants			Share of All Rural Spending
	Rural	Urban	All	
	---------- 000s $ ----------			-- % --
Resident Hunters	34,610	82,568	117,178	28.8
group percent	29.5	70.5		
Resident Anglers	64,723	155,989	220,712	54.3
group percent	29.3	70.7		
Total Resident	99,333	238,558	337,891	83.1
group percent	29.4	70.6		
Nonresident Hunters	14,681	27,992	42,673	10.5
group percent	34.4	65.6		
Nonresident Anglers	8,792	17,392	26,184	6.4
group percent	34.4	65.6		
Total Nonresident	23,473	45,384	68,857	16.9
group percent	34.1	65.9		
Total, All Groups	122,806	279,804	406,748	100.0
group percent	30.2	69.8		

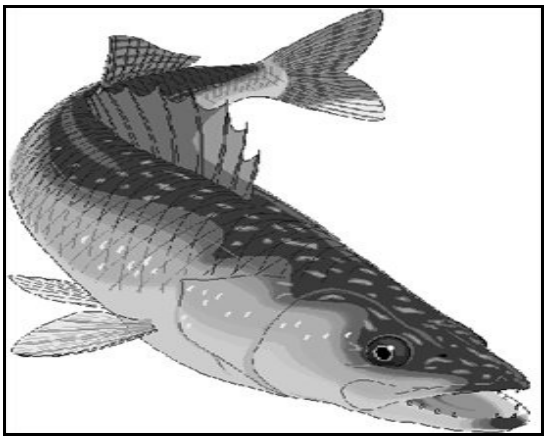


Table 7. Comparison of Average Variable, Fixed, and Total Season Expenditures, by Activity, North Dakota, 2001-2002 and 2011-2012

Category	2001-2002 Season Expenditures[a]			2011-2012 Expenditures			Change in Total
	Variable	Fixed	Total	Variable	Fixed	Total	
Resident	---------- 2011 $ ----------						
Deer							
Archery	345.72	459.57	805.29	615.49	598.64	1,214.13	50.8%
Firearm	278.77	268.30	547.07	406.64	177.94	584.58	6.9%
Gratis	175.09	107.37	282.46	298.96	144.41	443.37	57.0%
Muzzleloader	na	na	na	246.47	146.54	393.01	na
Special Big Game	838.03	341.62	1,179.69	898.89	301.33	1,200.22	1.7%
Furbearer	250.84	473.48	724.32	367.03	385.62	752.65	3.9%
Small Game							
Upland	414.86	502.79	917.65	547.61	222.61	770.22	-16.1%
Waterfowl	475.62	552.74	1,028.36	577.81	319.79	897.60	-12.7%
Fall Turkey	137.17	168.82	305.99	154.94	74.85	229.79	-24.9%
Spring Turkey	na	na	na	134.58	75.97	210.55	na
Fishing							
Open Water	874.03	1,716.20	2,590.25	842.36	2,177.76	3,020.12	16.6%
Ice	348.11	438.04	786.14	382.26	299.59	681.85	-13.3%
Darkhouse	219.06	353.49	572.55	218.48	202.15	420.63	-26.5%
Nonresident							
Deer							
Archery	1,254.30	231.11	1,485.42	825.92	138.34	964.26	-35.1%
Firearm	509.31	114.72	624.03	660.10	130.51	790.61	26.7%
Small Game	813.78	161.57	975.35	829.96	170.59	1,000.55	2.6%
Furbearer	na	na	na	699.44	234.99	904.43	na
Fishing	724.65	397.56	1,122.21	659.16	448.60	1107.76	-1.3%

Note: Due to rounding, variable and fixed expenses may not equal total expenses. na=not available.

[a] Adjusted for inflation to reflect 2011 dollars using the Consumer Price Index (U.S. Department of Labor 2012).

Hunter and Angler Participation

Resident firearm deer, waterfowl, upland game and fall turkey seasons had fewer participents in the 2011-12 season than in the 2001-02 season (Table 8). All other survey groups had increased license sales from the 2001-02 to 2011-12 season. The number of special big game hunters increased from 375 hunters in 2001-02 to 675 hunters in 2011-12. Sales of most types of resident deer licenses except for firearm deer, increased between 2001-02 to 2011-12, resulting in a 3 percent increase in the number of participants.

The total number of licenses sold allowing furbearer hunting in the state increased by 46 percent from 2001-02 to 2011-12, the number of furbearer hunters increased by 66 percent. While the sales of licenses allowing residents to hunt upland game and waterfowl increased over the period by 18 percent, the number of resident waterfowl hunters decreased by 29 percent. Resident turkey license sales and the number of turkey hunters decreased by 24 percent and 36 percent, respectively, from 2001-02 to 2011-12. The number of resident anglers participating in open water fishing remained constant from 2001-02 to 2011-12 (Table 8).

License sales increased in all nonresident categories except for fishing licenses from 2001-02 to 2011-12 (Table 8). The number of nonresident archery deer hunters increased by 124 percent from 2001-02 to 2011-12. Nonresident small game hunters decreased by 3 percent over the period, going from about 41,329 individuals to 39,947 individuals. The number of nonresident anglers also increased slightly (2 percent) over the period, going from about 36,099 individuals in 2001-02 to 36,669 individuals in 2011-12 (Table 8).

Total Direct Expenditures

As a result of increased average per person spending in most hunting and fishing survey groups and increased number of participants in most groups, total direct expenditures in North Dakota increased by $47.8 million (6.5 percent) from 2001-02 to 2011-12 (Table 9). Expenditures for nondurable goods and durable goods and services increased by 11 percent and 3 percent, respectively, over the period.

Total direct expenditures by resident hunters and anglers increased by $43.6 million or 8.5 percent from 2001-02 to 2011-12 (Table 9). Total direct expenditures by nonresident hunters and anglers increased by $4 million, or 5 percent over the period. Expenditures for hunting (resident and nonresident) increased by $5.7 million (2.7 percent) from 2001-02 to 2011-12, while expenditures for fishing (resident and nonresident) increased by $42 million or 11 percent.

Table 8. Comparison of License Sales and Active Participants, by Activity, North Dakota, 2001-2002 and 2011-2012

	2001-2002 Season		2011-2012 Season		Percentage Change 2001-02 to 2011-12	
Activity	Licenses	Participants	Licenses	Participants	Licenses	Participants
Resident						
Deer						
Archery	11,903	11,247	18,515	16,478	56	47
Firearm	95,368	88,583	91,935	82,830	-4	-7
Gratis	11,137	9,064	14,789	12,541	33	38
Muzzleloader	1,717	1,586	2,106	1,790	23	13
Special Big Game	386	375	689	675	79	80
Furbearer	50,389	25,708	73,523	42,643	46	66
Small Game						
Upland	66,954	52,749	78,715	51,952	18	-2
Waterfowl	66,954	35,215	78,715	25,189	18	-29
Turkey						
Fall Regular	6,191	4,931	4,708	3,154	-24	-36
Fall Gratis	448	319	na	na	na	na
Spring Regular	2,672	2,376	6,672	4,804	150	102
Spring Gratis	304	216	na	na	na	na
Fishing						
Open Water	136,262	116,828	125,286	116,516	-8	0
Ice	136,262	50,948	127,286	46,356	-8	-9
Darkhouse Spearing*	1,287	930	1,842	1,326	43	43
Nonresident						
Deer						
Archery	1,325	1,260	2,884	2,826	118	124
Firearm	1,510	1,399	4,045	3,641	168	160
Small Game	41,702	41,329	42,049	39,947	1	-3
Furbearers	na	na	4,310	2,500	na	na
Fishing	40,353	36,099	38,197	36,669	-5	2

*ND Game and Fish does not record darkhouse spearing participation. 2011 participation rate assumed to be the same as in 2001.
na= not available

Expenditures by resident hunters increased by $2.7 million or 1.6 percent, while expenditures by nonresident hunters increased by $3.0 million or 7 percent (Table 9). Expenditures by nonresident anglers increased by $1.2 million or 3 percent, while expenditures by resident anglers increased by $42.1 million or 11 percent.

Only six survey groups had less total spending in 2011-12 than in 2001-02 (Table 10). Corresponding closely with decreased number of participants, total direct expenditures from resident fall turkey, resident waterfowl, resident ice fishing, resident waterfowl hunters, resident upland game, and resident firearm deer hunters decreased by 45 percent, 38 percent, 21 percent, 16 percent, and 7 percent, respectively.

Total direct expenditures by resident archery deer hunters increased by 131 percent, while total direct expenditures for muzzleloader hunters increased by 21 percent from 2001-02 to 2011-12 (Table 10). Resident deer hunters, collectively, spent over $13 million more in 2011-12 than in 2001-02. Total direct expenditures by special big hunters increased by 75 percent over the period. Total spending for resident small game hunters (upland and waterfowl) decreased by 25 percent, which included a 38 percent decline for waterfowl hunters and an 16 percent decrease for upland game hunters. Total spending by resident fall turkey hunters decreased by 45 percent from 2001-02 to 2011-12.

Resident anglers participating in open water fishing spent $50.0 million more in 2011-12 than in 2001-02, which was the largest monetary increase of any hunting or angling survey group. Total direct expenditures for resident ice fishing activities decreased by 21.1 percent or $8.4 million from 2001-02 to 2011-12 (Table 10).

Total spending by nonresident archery deer hunters increased by 38 percent ($0.7 million) from 2001-02 to 2011-12, and nonresident firearm deer hunter expenditures increased 277 percent. Nonresident angler expenditures increased by $1.2 million, or 3 percent over the period. Nonresident small game hunter expenditures, which includes upland game and waterfowl hunting, also decreased by $1.9 million (5 percent) over the period (Table 10).

Total Economic Effects

Generally, the percentage change in secondary and total economic effects between the 2001-02 to 2011-12 seasons paralleled the percentage change in total direct expenditures (Table 11). Total direct expenditures for combined resident and nonresident hunting and fishing increased 8.0 percent from 2001-02 to 2011-12, while total economic effects increased by 7.2 percent over the period.

Secondary economic effects from hunting and fishing in North Dakota increased from $692 million in 2001-02 to $737 million in 2011-12. The total economic effects (i.e., direct and secondary effects in all sectors) of resident and nonresident hunter and angler expenditures in North Dakota in 2001-02 was estimated at $1.3 billion compared to $1.4 billion in 2011-12. Hunting and fishing activities produced an increase of $93 million in total business activity within the state over the period (Table 11).

Gross business volume (i.e., direct and secondary effects) from hunting activities in the state from 2001-02 to 2011-12 increased 3 percent or by $12 million, while the gross business volume from fishing activities increased 10 percent or by $81 million (Table 11).

Table 9. Comparison of Total Direct Expenditures, by Residence and Activity, North Dakota, 2001-2002 and 2011-2012

	Total Direct Expenditures		Change from 2001-02 to 2011-12	
Category	2001-2002[a]	2011-2012	Dollars	Percent
All Activities	---------- 000s 2011 $ ----------			
Variable Expenses	259,579	287,704	28,125	10.8
Fixed Expenses	335,436	355,106	19,670	3.3
Total	595,014	642,810	47,796	6.5
All Activities				
Residents	511,372	555,701	43,593	8.5
Nonresidents	83,642	87,842	4,200	5.0
All Hunting	211,308	217,488	5,734	2.7
Residents	168,175	170,889	2,715	1.6
Nonresidents	43,132	46,153	3,021	7.0
All Fishing	383,708	425,768	42,060	11.0
Residents	343,197	384,079	40,882	11.9
Nonresidents	40,510	41,689	1,179	2.9

Note: Totals may not add due to rounding.
[a] Adjusted for inflation to reflect 2011 dollars using the Consumer Price Index (U.S. Department of Labor 2012).

Table 10. Comparison of Total Direct Hunter and Angler Expenditures, by Hunting and Fishing Activity, North Dakota, 2001-2002 and 2011-2012

	Total Direct Expenditures		Change from 2001-02 to 2011-12		Percentage of Total Direct Expenditures	
Activity	2001-2002	2011-2012	Dollars	Percent	2001-2002	2011-12
Resident	----------000s 2011 $----------					
Antelope						
Archery[b]	924	na	na	na	0.2	na
Firearm[b]	462	na	na	na	0.1	na
Gratis[b]	62	na	na	na	0.0	na
Deer						
Archery	9,057	20,959	11,902	131.4	1.5	3.3
Firearm	48,460	44,995	-3,465	-7.2	8.2	7.1
Gratis	973	6,080	5,107	524.9	0.2	1.0
Muzzleloader[a]	623	754	131	21.0	0.1	0.1
Special Big Game	442	772	330	74.7	0.1	0.1
Furbearer	18,621	32,638	14,017	75.3	3.1	5.2
Small Game						
Waterfowl	36,213	22,329	-13,884	-38.3	6.1	3.5
Upland	48,406	40,522	-7,884	-16.3	8.2	6.4
Turkey						
Fall Turkey	1,509	828	-681	-45.1	0.3	0.1
Fall Gratis[b]	52	na	na	na	0.0	na
Spring Turkey[a]	740	1,011	271	36.6	0.1	0.2
Spring Gratis[a,b]	44	na	na	na	na	na
Fishing						
Open Water	302,612	352,617	50,005	16.3	51.0	55.5
Ice	40,053	31,607	-8,446	-21.1	6.7	5.0
Darkhouse Spearing	533	587	54	10.1	0.1	0.1
Nonresident						
Antelope Archery	77	na	na	na	0.0	na
Deer						
Archery	1,872	2,587	715	38.2	0.3	0.4
Firearm	873	3,289	2,416	276.7	0.1	0.5
Small Game	40,311	38,432	-1,879	-4.7	6.8	6.0
Furbearer	na	2,299	na	na	na	0.4
Fishing	40,510	41,689	1,179	2.9	6.8	6.5

[a] These groups were not surveyed in 2001. Average season expenditures in 2001 were set to the 1996 average expenditures after adjusting for inflation. The change in total direct expenditures depicted in the table for these groups between 2001 and 2011 is due only to a change in hunter participation.

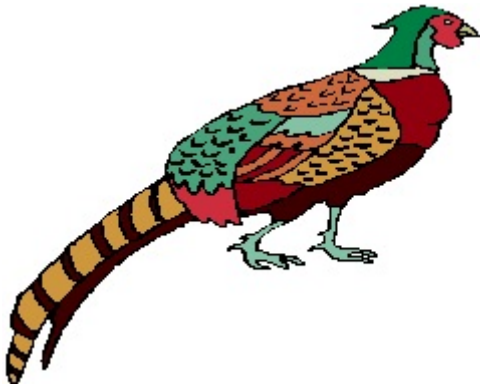
[b] These were not surveyed in 2011

na= not available

Table 11. Comparison of Total Economic Contribution of Resident and Nonresident Hunting and Fishing Activities in North Dakota, 2001-2002 and 2011-2012

Activity	2001-2002 Season[a]	2011-2012 Season	Change 2001/02 to 2011/12	
Hunting	----------000s $----------			- % -
Direct Expenditures	211,306	217,489	6,183	2.9
Secondary Effects	252,708	258,415	5,707	2.3
Gross Business Volume	464,016	475,904	11,888	2.6
Fishing				
Direct Expenditures	383,708	425,321	41,613	10.8
Secondary Effects	439,315	478,587	29,291	8.9
Gross Business Volume	823,024	903,908	80,884	9.8
Total Hunting and Fishing				
Direct Expenditures	595,017	642,810	47,793	8.0
Secondary Effects	692,023	737,002	44979	6.5
Gross Business Volume	1,287,040	1,379,812	92,772	7.2
State Tax Collections[b]	38,767	40,056	1,289	3.3

[a] Adjusted for inflation to reflect 2011 dollars using the Consumer Price Index (U.S. Department of Labor 2012).
[b] State tax collections include sales and use, personal income, and corporate income taxes.



Conclusions

The popularity of hunting and fishing in the state remains high even though the state has seen a reduction in habitat over the last decade. New challenges are emerging in the state as wildlife management officials and policymakers attempt to mitigate the loss of wildlife habitat in a period of high crop prices. Population of most wildlife species increased during the 1990s and 2000s, contributing to an increase in hunter and angler participation. Along with the increase in hunters and anglers, spending associated with hunting and fishing also increased. Socio-economic data on hunters and anglers in the state has been periodically collected and assessed since the late 1970s. This study represents a continuation of those efforts, and provides insights into hunter and angler characteristics and the economic effects of hunting and fishing on the state and rural economies.

Resident and nonresident hunters and anglers are participating about the same number of days and traveling similar distances as they did in the early 2000s. Resident hunters and anglers continue to spend more time hunting and fishing in the state than nonresidents. Household incomes of nonresidents remain higher than residents. The majority of resident and nonresident hunters and anglers continue to be male, are in their mid-40s, and hunt on private land. Recent changes in characteristics included a substantial increase in gross household incomes for both resident and nonresident participants and an increase in the percentage of resident hunters and anglers living in urban communities.

Expenses for durable and nondurable goods used while hunting and fishing in North Dakota varied substantially among the activities surveyed. Generally, among the hunting categories, turkey hunters had the lowest per person spending and archery and special big game hunters had the highest per person spending, while resident anglers had the highest season expenditures of all activities. Perhaps of greater importance than relative spending levels among the various hunting/fishing activities is the long-term trend in hunter and angler spending. In previous economic assessments of hunter and angler spending, average season expenditures were increasing across nearly all hunting and fishing categories. The change in average per person spending across all hunting and angling activities, after adjusting for inflation, was mixed from 2001 to 2011. Reductions in per person spending were observed in resident upland game, resident waterfowl, resident fall turkey, resident ice fishing and nonresident deer archery. Large increases in average seasonal expenditures, after adjusting for inflation, were observed in resident archery deer, resident gratis deer, nonresident firearm deer, and resident open water fishing.

One explanation for the decrease in average seasonal expenditures across several hunting categories may be due to the timing of the expenditure survey. In past studies, information on spending was solicited shortly after each respective season closed. This study surveyed all participants in the summer of 2012, which would represent a departure from collecting data over a longer period that allowed data collection to coincide with season closure. The lag in time from when the spending occurred and when the information was requested may have resulted in lower recollection of all expenses during the season. Other potential explanations can be more attributable to the type of weather or opportunities present in

the 2011-12 seasons. For example, resident ice fishing average season expenditures decreased by 21 percent from 2001-02 and along with large percentage decreases in days fished. The decrease in spending and days fished may be due to poor ice conditions during the winter of 2011-12.

Comparisons between resident and nonresident per person season spending yielded several similarities and differences. The biggest disparity in per person spending occurred in season-long fishing where residents spent 172 percent more than nonresidents. The main reason for the difference was that resident anglers purchased their boats and motors in North Dakota while nonresidents did not. Little difference in per person spending existed for resident and nonresident small game and firearm deer hunters. Generally, average spending per day was higher for nonresidents; however, nonresidents typically hunt fewer days than residents. Despite a substantial difference in total per person spending between resident and nonresident anglers, spending per day between the two groups was nearly identical. As a rule of thumb, season spending levels per participant appear to be more influenced by the type of activity, than by the residence of the participant.

While some differences exist between resident and nonresident spending for similar activities, those differences have less effect on the state economy than the number of participants. On the margin, adding or subtracting an equal number of resident or nonresident participants in the same hunting/fishing activity has similar economic consequences to the state economy. Nonresidents have a slightly greater per person impact on some services, such as lodging, guides, and food, while residents have a greater influence on other services, such as taxidermy, repairs, meat processing, and veterinarian care.

The relative share of spending in the various hunting and fishing activities compared to total spending remained mostly unchanged from 2001 to 2011. In 2011, hunting continued to represent about one-third of all expenditures, and fishing continued to represent two-thirds of all expenditures. Expenditures for the categories with the most participation (small game, deer, and fishing) all maintained about the same relative percentage of total expenditures in 2011 as they did in 2001. Thus, no single hunting or fishing category substantially changed its relative importance when compared to other activities from 2001 to 2011.

Hunting and fishing continues to be an economically important industry in North Dakota largely due to stable numbers of participants and consistent per person spending. The continued popularity of hunting and fishing has created new challenges for wildlife management officials and state policymakers. While information on the economic effects of hunter and angler expenditures can be important in making wildlife management decisions; economic information alone can not address all of the issues currently facing policymakers in the state. In the quest to capture economic activity from hunting and fishing activities, care should be exercised that the demand for wildlife-based recreation be matched with the biological and public limits of wildlife-based resources.

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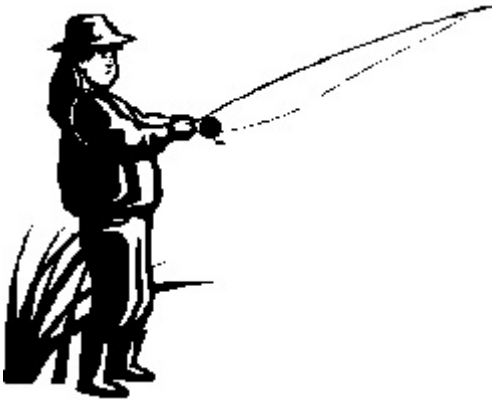

Acknowledgments

This document is a summary of a more comprehensive report which contains supplemental information and additional documentation of study results. Copies of this report and a single copy of the main report, *Resident and Non resident Hunter and Angler Expenditures, Characteristics, and Economic Effects, North Dakota 2011.* are available free of charge. Please address your inquiry to Edie Nelson, Department of Agribusiness and Applied Economics, North Dakota State University, P.O. Box 5636, Fargo, ND 58105-5636, phone 701-231-7441, fax 701-231-7400, e-mail edie.nelson@ndsu.edu or these publications can be found on the Internet at the following web site: http://agecon.lib.umn.edu/ .

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