



2016 VERMONT WILDLIFE HARVEST REPORT – MOOSE



VERMONT

FISH & WILDLIFE DEPARTMENT

(802) 828-1000 / www.vtfishandwildlife.com



2016 Vermont Moose Harvest Report

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The MISSION of the Vermont Fish & Wildlife Department is the conservation of fish, wildlife, and plants and their habitats for the people of Vermont.

Vermont Fish & Wildlife Department

Agency of Natural Resources

1 National Life Drive, Davis 2

Montpelier, Vermont 05620-3702

(802) 828-1000 / www.vtfishandwildlife.com

Most of the programs described in this report are funded through the *Federal Aid in Wildlife Restoration Program*. This program was initiated in 1937 as the Federal Aid in Wildlife Act and created a system whereby taxes are paid on firearms, ammunition and archery equipment by the public who hunts. Today this excise tax generates over a hundred million dollars each year that are dedicated to state wildlife restoration and management projects across the United States. The State of Vermont uses these monies for acquiring land, and for restoring and managing wildlife. These excise tax dollars, coupled with state hunting license fees, have been the predominant source of money funding the successful restoration and management of Vermont's wildlife resources.

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2016 Moose Report

Seventy-two moose were harvested in Vermont's 2016 moose seasons. Nine moose were taken during the archery-only season and 63 in the regular season. An estimated 11 tons of moose venison was harvested during the combined seasons, providing 87,000 meals.

Archery Season

For Vermont's sixth annual archery-only moose season, a total of 2,228 valid lottery applications were received (1,652 residents and 576 non-residents). Specific numbers of permits were allocated for individual or a combination of Wildlife Management Units (WMUs), and only bulls could be harvested statewide. Twenty-seven permits were issued, with 23 allocated to residents, and 4 to non-residents. One each of the residents and non-residents won their permits through the annual auction.

Harvest Dates and Success Rates

The archery moose season ran for seven days, from October 1-7, during the peak of the moose rutting season. Bulls are more responsive to calling at this time of year compared to mid-October, thus increasing the odds that bow hunters are able to call in moose to within shooting distance. Moose were taken on each day of the season except day 4 (Table 1). The overall success rate was 33%, up from 24% in 2015 and slightly below the average of 35% for the previous five seasons combined. Success rates by WMU are given in Table 2.

TABLE 1. 2016 ARCHERY MOOSE HARVEST BY DAY OF SEASON

Season Day	1	2	3	4	5	6	7
Moose Harvested	2	1	3	0	1	1	1

Harvest Data

The Vermont Fish & Wildlife Department does not operate official biological check stations during the moose archery season. This is because with the low permit numbers and statewide distribution of the archers, it would not be cost



Scouting

Moose hunter surveys were returned by 11 (41%) of the 27 archery season hunters, all of whom reported that their party scouted prior to the hunting season. Average time spent scouting was 36.1 hours/party, and the average number of moose seen per hour scouted was 0.088, or approximately 1 moose seen for every 11 hours of scouting effort.

Hunting Information

All but 1 of the 11 archery survey respondents saw at least one moose during the open season; the total moose seen was 45. Four different hunters passed up on a total of five bulls; all four of these hunters eventually tagged a moose. Hunting methods used included calling (all 11 respondents), still hunting (8), ground blinds (2), tracking and tree stand (1 each).

effective to staff check stations. Instead, successful moose archers may report their kill to any authorized regular big game reporting station. Some of these stations are set up to weigh moose, and most also recorded antler spreads and point totals from the bulls. This data is presented in Table 3. Scaled carcass weights were obtained for seven moose, the largest weighing 800 pounds. This bull also had the widest spread at 46 inches. Eight moose were taken by residents and one by a non-resident from Schenectady, New York. One moose was taken by an archer using a crossbow.

TABLE 2. 2016 VERMONT ARCHERY MOOSE HUNTER SUCCESS RATES BY WMU

WMU	Permits Issued	Harvest	2016 Percent Success	2015 Percent Success
B/C	3	1	.33	.20
D1	1	0	0	.40
D2	3	0	0	0
E1	6	3	.50	.42
E2	5	3	.60	.33
Z*	9	2	.22	.08
Totals	27	9	.33	.24

*WMUs G, H, I, J1, J2, L, M, O, P, and Q were all available to persons with a permit for area "Z". The two "Z" harvests were from WMUs H and M.

TABLE 3. 2016 VERMONT LEGAL MOOSE ARCHERY SEASON HARVEST DATA

Last Name	WMU	Town Kill	Age Class	Cementum Age	Sex	Weight (lbs)	Spread (inches)	Total Points
Compagna	E2	Ferdinand	Adult	4	M	771	43	13
Covey	E1	Bloomfield	Adult	—	M	—	24	7
Decker	E2	Ferdinand	Adult	7	M	800	46	13
Jacobs	C	Westfield	Adult	2	M	602	36	10
Jensen	E1	Canaan	Adult	2	M	431	25	3
Maloney	E1	Norton	Adult	1	M	548	23	6
Oliver	H	Groton	Adult	—	M	596	—	8
Rose	M	Pittsfield	Adult	—	M	—	44	12
Senecal	E2	Victory	Adult	—	M	538	—	11



Nick and Kevin Campagna,
Essex County, 2016.
*Courtesy Vermont Big Game
Trophy Club.*

Regular Season

A total of 7,773 valid applications were received for the 2016 Vermont regular moose season lottery (4,650 residents and 1,652 non-residents). Unsuccessful applicants from the previous seasons were awarded bonus points if they applied again in 2016. Eighty-seven percent of the permits (123) were allocated to residents and the remainder (18) to non-residents. Included in this total were three permits won through an auction process, and three Special Opportunity Permits issued to youths with a life-threatening illness, through a sponsoring organization. Fifty permits (35%) were valid for moose of either-sex, while the remaining 91 (65%) were valid only for bull moose.

Harvest Dates and Success Rates

Vermont's 24th moose season began on the third Saturday in October (15th) and ran for six days. The opening weekend weather was very

favorable for hunting with seasonably cool temperatures and no precipitation. Warmer temperatures and occasional rain, however, occurred over the remaining four days, and throughout the season hunter visibility was reduced due to the later than normal leaf fall. Over a third of the moose harvest occurred on opening day (Table 4). Overall success rate was 45%, down slightly from 47% the previous year (Table 5).

Biological Data

Fifty-three (84%) of moose taken were bulls, nine (14%) were cows, and one (2%) was a calf. Completely-dressed carcass weights were obtained from 55 moose, or 87% of the total harvest. Five bulls weighed over 750 lbs. and the largest was an 864-lb., 8-year old taken in Windham. This bull also had the widest spread at 55 inches. The average completely-dressed weight of 3 yearling and 42 older bulls was 444 and 642 lbs., respectively.

TABLE 4. 2016 VERMONT MOOSE HARVEST DISTRIBUTION BY DATE, SEX, AND AGE CLASS

Date	Bulls	Cows	Calves	Total	Percent
October 15	18	3	1	22	.35
October 16	10	—	—	10	.16
October 17	6	2	—	8	.13
October 18	10	2	—	12	.19
October 19	3	2	—	5	.08
October 20	6	—	—	6	.09
Totals	53	9	1	63	1.00

TABLE 5. 2016 VERMONT MOOSE HUNTER SUCCESS RATES BY WMU

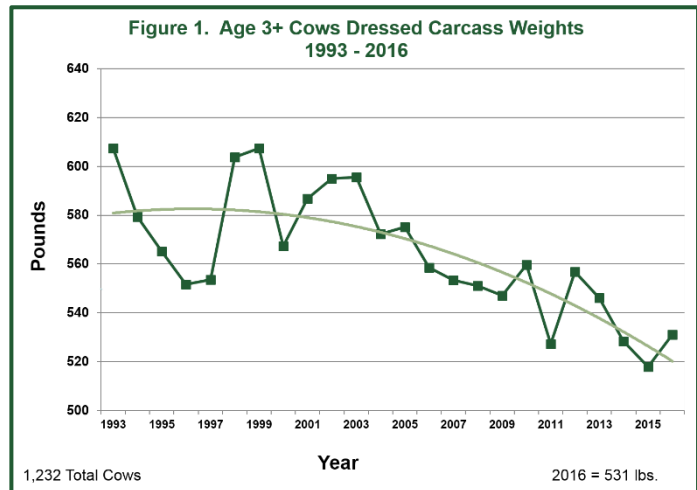
WMU	Bulls	Cows	Male Calves	Female Calves	Total Harvest	Permits Issued	2016 Percent Success	2015 Percent Success
B & C	7	2			9	20	.45	.67
D1	2				2	10	.20	.33
D2	8				8	16	.50	.30
E1	13	7		1	21	30	.70	.73
E2	8				8	15	.53	.47
G	2				2	5	.40	.40
H	2				2	5	.40	.20
I	4				4	10	.40	.50
J1						5	0	.30
J2	1				1	5	.10	.30
L	2				2	5	.40	.80
M & O	3				3	10	.30	.50
P & Q	1				1	5	.20	.36
Totals	53	9		1	63	141	.45	.47
% of Total	.84	.14		.02				

Permit total of 141 includes 3 auction winners and 3 Special Opportunity Permits.

The heaviest cow was a 674 lbs., 12-year taken in Brighton. The average weight of seven mature cows (age three and older) was 531 lbs. (Figure 1). High moose populations in the Northeast Kingdom from 2001 to 2009 caused overbrowsing of food supplies which led to lower body weights. Following the reduction of the moose herd through high permit quotas and antlerless-only permits, there were some annual increases in body weights. The overall trend, however, has been downward, likely due to the debilitating effects of high winter tick infestations. The Department again sampled larval tick loads on moose harvested in 2016 and found an average of 16.9 ticks/bull, down 16% from the previous year and 40% lower than the first count in 2013 (28.4 ticks/bull).

Complete sets of ovaries (reproductive organs) were collected from six cows (a return rate of 67%). Ovaries are then sectioned to count corpora lutea, which indicates that an egg was shed. In healthy populations with access to plenty of food, this index of calf production

for prime-aged cows (ages three and older) ranges from 1.25 to 1.75 ova (or egg) produced per cow. The average number of ova per prime-aged cow in 2016 was only 0.67. Cows generally must have a dressed weight of at least 440 lbs. to produce one calf, and at least 550 lbs. to have twins. Ovulation rates, while fluctuating from year to year, have followed a similar overall declining trend as carcass weights over the past 18 years (Figure 2).



A central incisor tooth was collected from 60 adult moose to establish age data. The average age of adult moose was 4.55 years (Figure 3). Forty-three percent of adults were four years old or older, which is well above the minimum goal of 25% as called for in the 10-year Big Game Plan. The two oldest moose were aged at 13 years (one cow and one bull). Only 7% were yearlings, down from 19% last year. Yearling percentages from road kills and other incidental moose mortalities were at 27% in each of the last two years, so perhaps the low proportion observed in the legal harvest is an artifact of a smaller sample size. Still, it may suggest low survival of calves last winter and/or reduced calf production in 2015.

Town of Kill

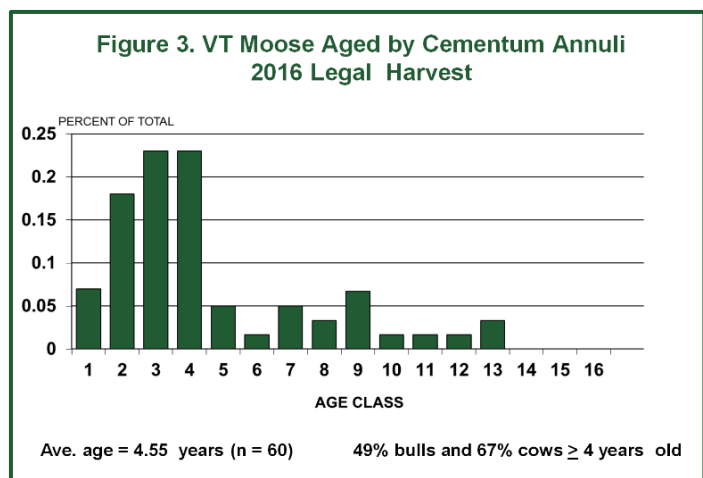
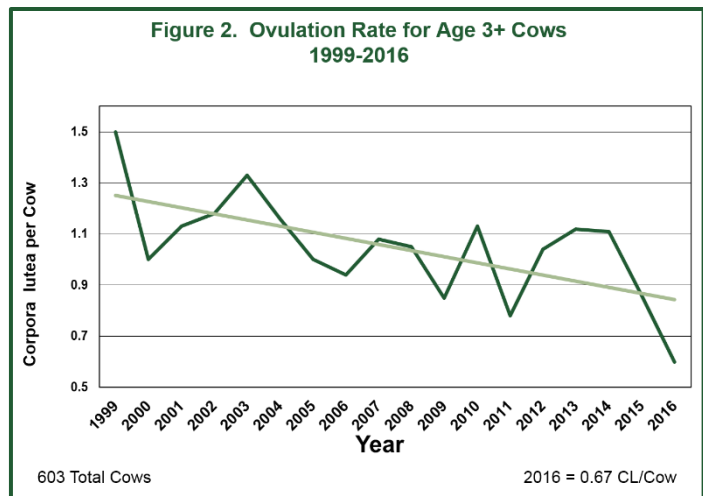
Moose were taken in 37 different towns. The towns with the highest harvests were Bloomfield, Brighton, Lewis, and Newark (four each), followed by Belvidere, East Haven, and Lemington (three each). Figure 4 shows the geographic distribution of the moose harvest by township and WMU.

Scouting

Moose hunter surveys were returned by 81 of the 141 permittees, 76 (94%) of whom reported that they scouted prior to the hunting season. Average time spent scouting was 32 hours/hunting party, and the average number of moose seen per hour scouted was 0.051, or approximately one moose seen for every 20 hours of scouting effort. The sighting rate was down 13% from the previous year (Table 6).

Hunter Success

Forty-six and 33% of resident and non-resident permits, respectively, were successfully filled. The six successful non-resident permittees hailed from four different states as follows: New York (three), and North Carolina, New Jersey, and Pennsylvania (one each). Sub-permittees took 12 (19%) of the moose killed.



All moose were taken with a rifle. Physical measurements from harvested moose are shown in Table 7 (males) and Table 8 (females).

Overall, 78 hunters were unsuccessful, and 40 (51%) of them returned a survey. Thirty percent of these unsuccessful hunters did not hunt all available days. The number of days hunted by the 40 respondents is shown in the following table:

Days Hunted	0	1	2	3	4	5	6
Number of Respondents	1	0	0	1	4	6	28

Each of the responding unsuccessful hunters saw at least one moose, and four of them passed up a total of five moose they believed they could have taken (three bulls, one cow, and two calves).

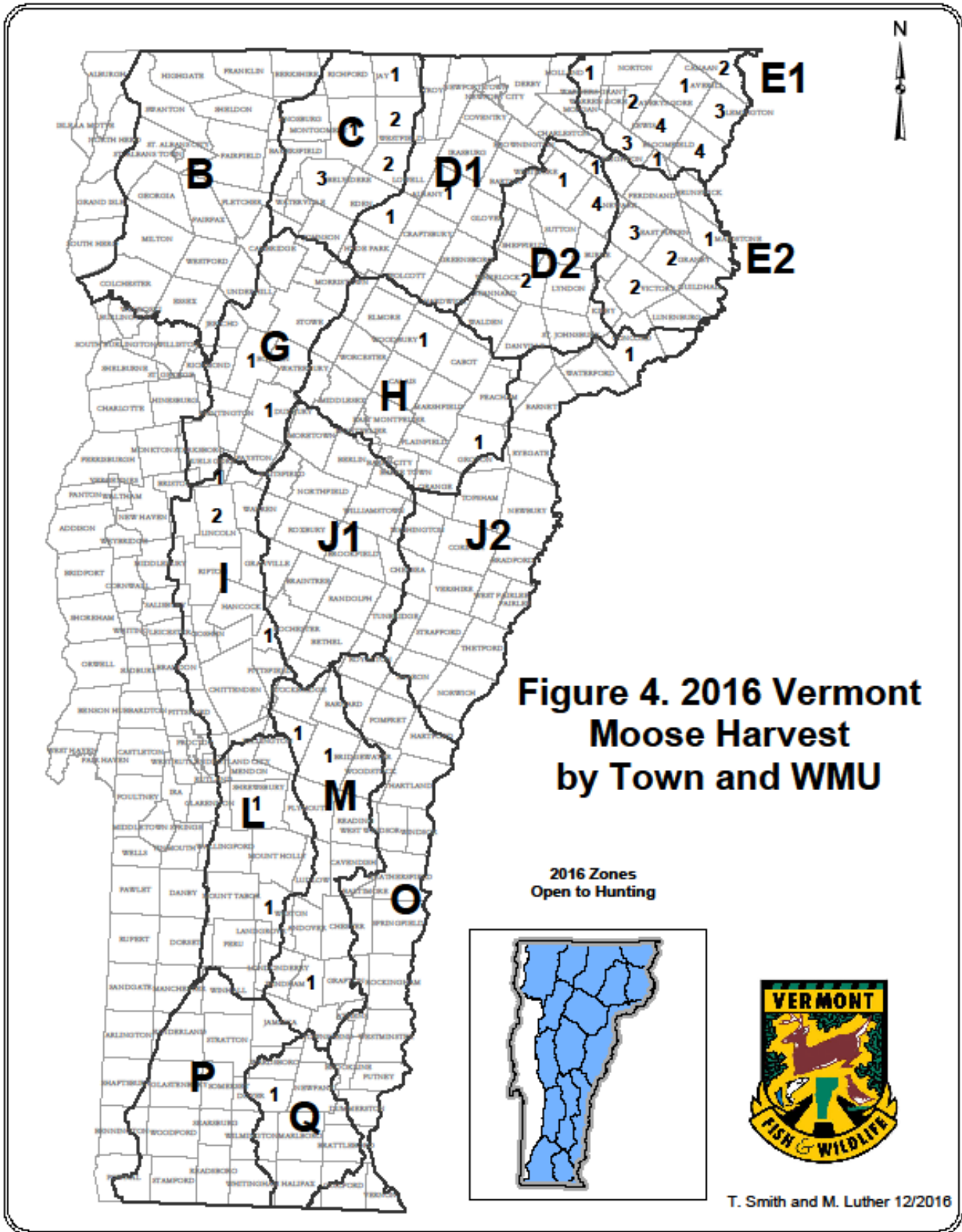


TABLE 6. MOOSE SEEN PER HOUR SCOUTED BY 76 HUNTERS WHO SCOUTED, 2016 VERMONT MOOSE HUNT

WMU	Number Scouting	Moose Seen	Hours Scouted	Moose/Hr Scouted	MSHS 2015	MSHS 2014	MSHS 2013	Hours/Hunter Scouting
B/C	13	5	314	0.016	0.041	0.02	0.03	24.2
D1	6	3	70	0.043	0.017	0.03	0.05	11.7
D2	10	13	330	0.039	0.050	0.06	0.07	33.0
E1	16	61	703	0.087	0.100	0.14	0.08	43.9
E2	4	25	118	0.212	0.077	0.05	0.09	29.5
G	3	0	104	0.000	0.000	0.03	0.06	34.7
H	3	3	119	0.025	0.038	0.06	0.02	39.7
I	5	3	292	0.010	0.059	0.04	0.11	58.4
J1	4	0	86	0.000	0.063	0.04	0.04	21.5
J2	3	9	48	0.188	0.060	0.02	0.02	16.0
L	3	0	155	0.000	0.095	0.01	0.04	51.7
M/O	3	2	58	0.034	0.045	0.08	0.04	19.3
P/Q	3	1	50	0.020	0.206	0.03	0.02	16.7
Totals	76	125	2,447	0.051	0.059	0.056	0.053	32.2

TABLE 7. 2016 VERMONT MOOSE LEGAL HARVEST DATA – BULLS ONLY

LAST NAME	WMU	TOWN of KILL	AGE	WGT	BEAM	PTS/L	PTS/R	SPREAD
AMBROZ II	E1	AVERY'S GORE	4		55	3	4	30.5
ATKINS	I	STARKSBORO	4	500	44	3	4	31
BANCROFT	E2	GRANBY	9	667	50.5	8	7	45.5
BEAULIEU	C	WESTFIELD	4	741	51	7	4	45
BENNETT	E1	BLOOMFIELD	2	515	41	4	4	30.5
BERTSCH	D1	ALBANY	3	533	37.5	3	2	26
BOUCHARD	E1	FERDINAND	3	550	39	3	4	19
BOUVIER	I	LINCOLN	10	586	47	4	4	37
CARDINAL	Q	DOVER	3	532				
CHAFFEE	D2	BRIGHTON	4	690	52	10	7	45
COLLINS	J2	CONCORD	9	722				45
DEDRICK	E1	BLOOMFIELD	4	783	49	7	7	35.5
DEMER	H	WOODBURY	2	521	43	2	2	25
DUNAKIN	E1	LEWIS	3		42.5	3	2	32
ERWIN	E2	MAIDSTONE						28
FEATHERS	L	WESTON	3	502	38	2	1	19.5
FECTEAU	D2	WESTMORE	2	592	45	6	5	33.5
GEIGER	E1	BLOOMFIELD	4	533	43.5	4	3	33

TABLE 7. 2016 VERMONT MOOSE LEGAL HARVEST DATA – BULLS ONLY

LAST NAME	WMU	TOWN of KILL	AGE	WGT	BEAM	PTS/L	PTS/R	SPREAD
GERARDI	D2	WHEELOCK	2	461	31	4	3	31
GOVE	E2	EAST HAVEN	3		48	5	3	33
GRAHAM	G	BOLTON	13	663	55	3	4	40.5
GRIFFITH	G	DUXBURY	5	599	47	3	3	40
HOEFT	E1	BLOOMFIELD	3	631	43	6	5	36
IVES	C	BELVIDERE	7	728	54	3	2	35
JAMIESON	C	LOWELL	2		38	3	3	22
JENNESS	D2	NEWARK	8	793	60.5	11	9	50
JONES	M	BRIDGEWATER	11	621		5	5	40
KENNY SR	D2	NEWARK	2	575	40.5	6	5	36.5
LACROSS	C	WESTFIELD	1	431	36	3	3	24
LAFOUNTAIN	C	BELVIDERE						
LAPERLE	E1	LEWIS	4	748	46.5	7	5	36.5
LAPIERRE	E2	VICTORY	4	818	58.5	8	8	50
LEHOULLIER	C	BELVIDERE	4	687	51	9	8	43
LEPINE	E1	LEMINGTON	3	578	40.5	4	7	36
LONGE	C	MONTGOMERY	2	662	47.5	4	5	34
MASSEY	D2	WHEELOCK	2	585	41	3	3	34
MCSWEENEY	E2	GRANBY	4	721	43.5	9	6	42
PILETTE	E2	VICTORY	5	624	46	7	6	39
RHEAUME	I	LINCOLN	4	767	57	8	9	48
ROYA	E1	LEMINGTON	4	677	48	6	6	
SHELDRIK	I	ROCHESTER	3	623	45	6	8	37
SHEPARD	D2	NEWARK	2	530	40.5	2	2	26.5
SHIELDS II	M	WINDHAM	8	864	48.5	11	10	55
SMITH JR	H	GROTON	5	728	47.5	8	8	46
SNOW	E1	LEWIS	4	659	42.5	6	6	34.5
STEVENS	E2	EAST HAVEN	3	558	42	5	3	32
TAFT	E1	LEMINGTON	7	742	50	8	10	47
TATRO	E1	AVERILL	3	684	42	4	3	32
TRACY SR	E2	EAST HAVEN	1	403	28.5	1	1	17
TWORIG III	M	KILLINGTON	2			3	3	24
WHEELER	D2	NEWARK	3	687	49	7	6	40.5
WILLEY	D1	EDEN	1	497	34.5	3	3	24.5
WILLIAMS	L	SHREWSBURY	3		47	6	4	28.5

Weight is carcass weight completely dressed in lbs., Beam is in millimeters, Pts. /Left and Right are number of points at least 1 inch long, Spread is in inches measured to the nearest half-inch. Age is cementum age except for 0.5 is a calf aged by tooth replacement at department-operated check station; Blank cells are unknown or missing data.

TABLE 8. 2016 VERMONT MOOSE LEGAL HARVEST DATA– FEMALES ONLY

LAST NAME	WMU	TOWN of KILL	WGT	AGE	OVARIES	CL1	CL2	TOTALCL
BAKER	C	JAY	513	3	YES (1)	1	X	X
BIGGS	E1	CANAAN	381	1	NO			
GORDON	E1	BRIGHTON	536	2	YES	1	0	1
GOYETTE	E1	AVERY’S GORE	494	9	YES	0	0	0
MOREY	E1	HOLLAND	545	7	YES	1	0	1
NOEL	E1	LEWIS	467	6	YES	0	0	0
OKEEFE	E1	BRIGHTON	674	12	YES	1	1	2
PALUZZI	E1	CANAAN	197	0.5	NO			
PIDGEON	E1	BRIGHTON	461	9	YES	0	0	0
RIVARD	C	LOWELL	564	13	NO			

Weight is carcass weight completely dressed in pounds; Total CL is number of corpora lutea; Age is cementum age except for 0.5 is a calf aged by tooth replacement; Blank cells are unknown or missing data.

2017 Permit Numbers

The moose herd in the Northeast Kingdom was finally reduced to target densities six years ago, after many years of overpopulation. To achieve this, high numbers of either-sex and antlerless-only hunting permits were issued from 2004 through 2010. Permit numbers returned to normal levels in 2011 and were reduced over each of the next three years as the statewide moose estimate continued to decline over this period. Despite population reduction, reproductive rates remained well below healthy levels, and permit numbers were reduced further for the 2015 season. In addition, for the first time, permits for most WMUs were restricted to bulls-only in order for populations to grow more quickly toward the desired levels. It is anticipated that bulls-only permits will be

used for no more than a few years, otherwise the adult sex-ratio could become out of balance, possibly leading to late- or un-bred cows.

The Department remains concerned about how a warming climate may affect moose health, including the potential to lead to more severe parasite infestations, most notably winter ticks and brainworm. A multi-year study was begun this January, with the radio-collaring of 30 cows and 30 calves, designed to learn more about the rate and cause of mortalities, and calf production. For now with continued declining indices of population size for many WMUs, the Department expects to propose a further reduction in permits for the 2017 hunt.

