

2017 - JCR Evaluation Form

SPECIES: Moose
 HERD: MO620 - LANDER
 HUNT AREAS: 2, 30, 39

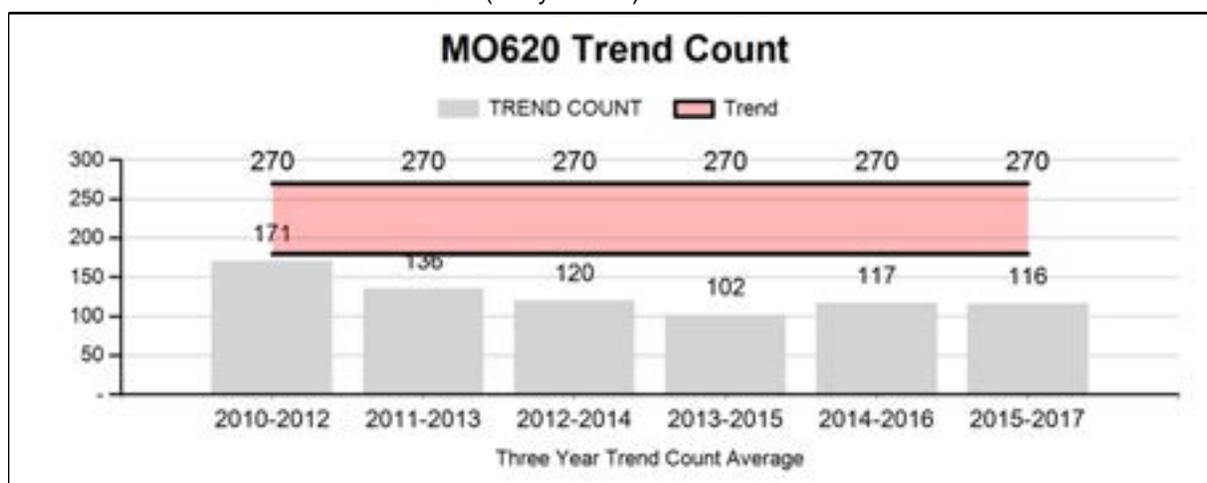
PERIOD: 6/1/2017 - 5/31/2018
 PREPARED BY: STAN HARTER

	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Trend Count:	119	110	150
Harvest:	8	5	5
Hunters:	10	5	5
Hunter Success:	80%	100%	100%
Active Licenses:	10	5	5
Active License Success	80%	100%	100%
Recreation Days:	105	69	60
Days Per Animal:	13.1	13.8	12
Males per 100 Females:	58	63	
Juveniles per 100 Females	41	48	

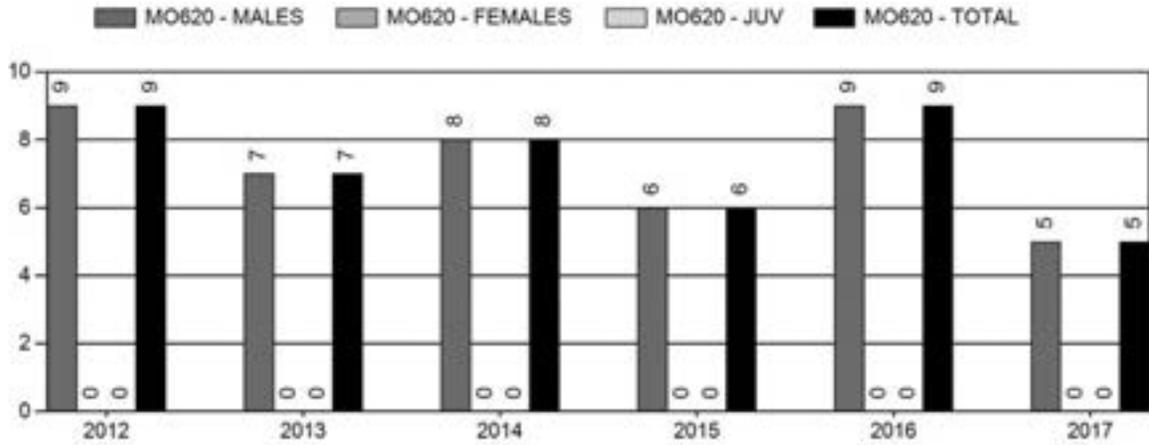
Trend Based Objective ($\pm 20\%$) 225 (180 - 270)
 Management Strategy: Special
 Percent population is above (+) or (-) objective: -51.1%
 Number of years population has been + or - objective in recent trend: 6

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

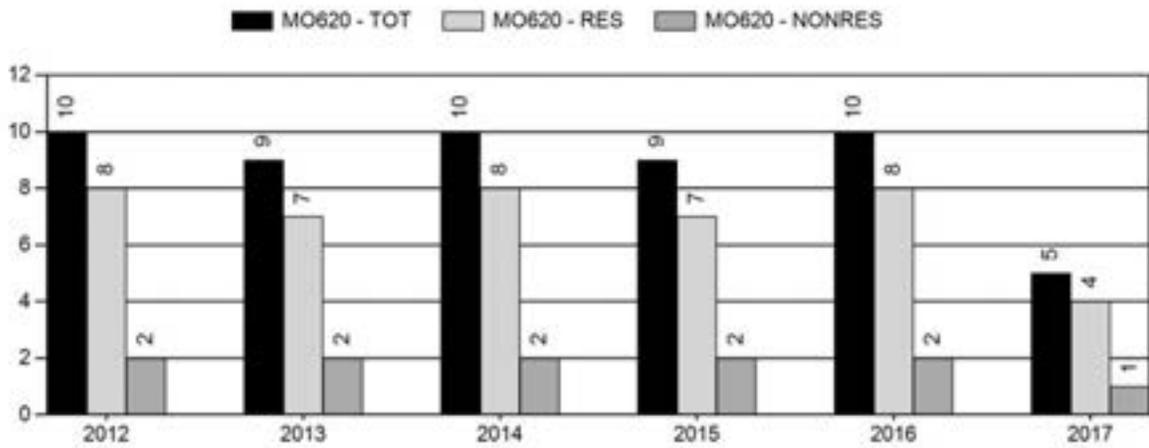
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



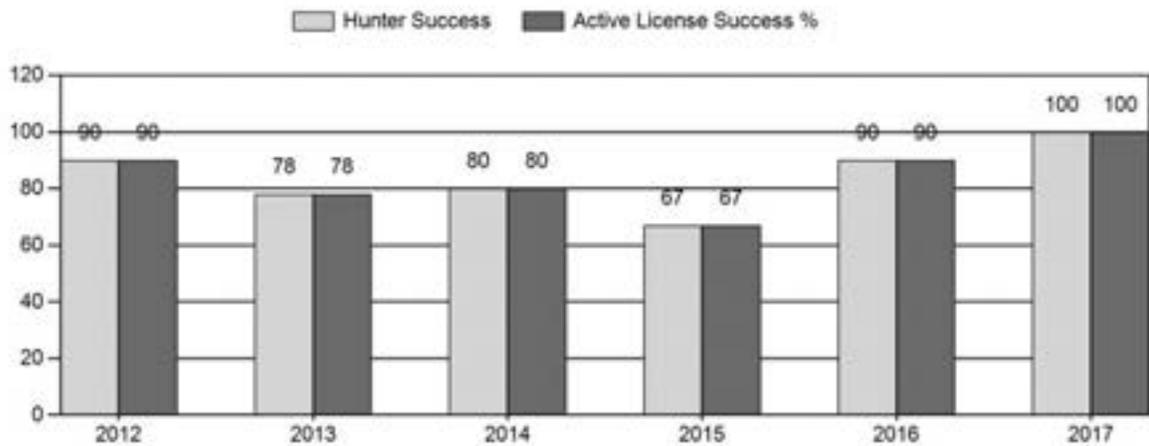
Harvest



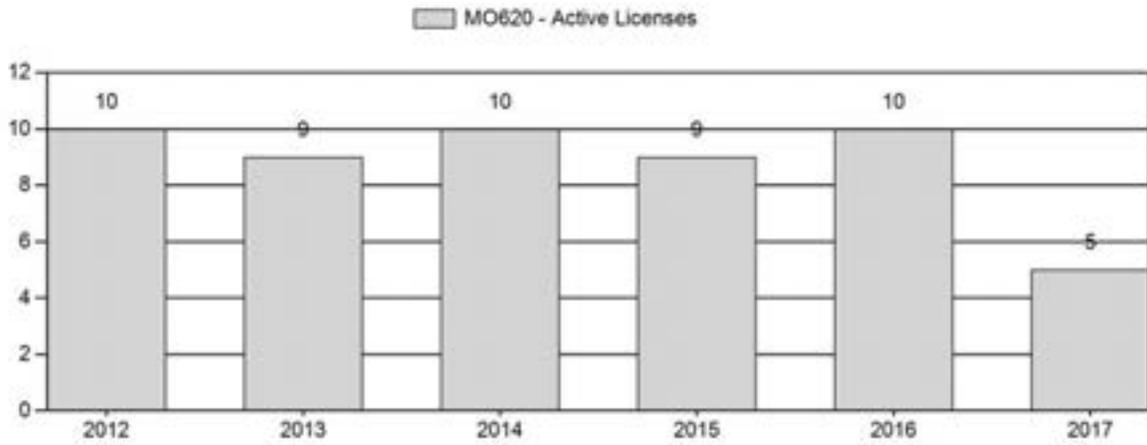
Number of Active Licenses



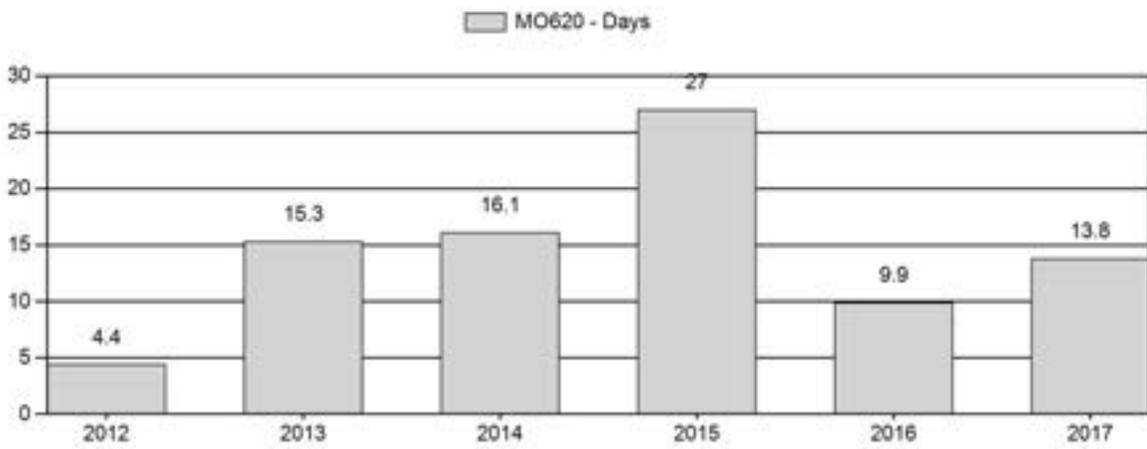
Harvest Success



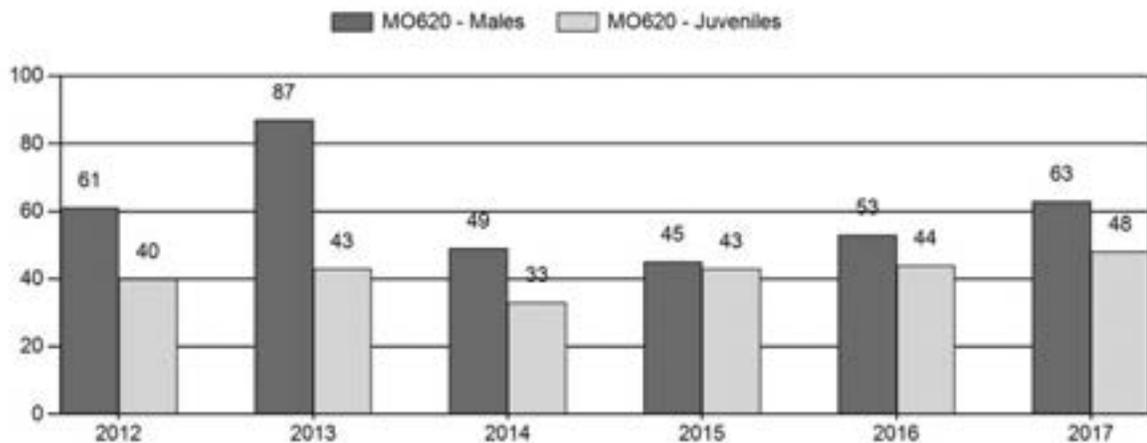
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2012 - 2017 Postseason Classification Summary

for Moose Herd MO620 - LANDER

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	0	0	0	43	30%	70	50%	28	20%	141	0	0	0	61	± 12	40	± 9	25
2013	0	0	0	40	38%	46	43%	20	19%	106	0	0	0	87	± 0	43	± 0	23
2014	0	0	0	30	27%	61	55%	20	18%	111	0	0	0	49	± 0	33	± 0	22
2015	0	0	0	20	24%	44	53%	19	23%	83	0	0	0	45	± 0	43	± 0	30
2016	0	0	0	38	27%	72	51%	32	23%	142	0	0	0	53	± 0	44	± 0	29
2017	0	0	0	33	30%	52	47%	25	23%	110	0	0	0	63	± 0	48	± 0	29

2018 HUNTING SEASONS
Lander Moose Herd Unit (MO 620)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
2, 30	1	Oct. 1	Nov. 20	5	Limited Quota	Antlered moose
39		CLOSED				
Archery		Sept. 1	Sept. 30			Refer to license type and limitations in Section 2

Hunt Area	License Type	Quota Change from 2017
2, 30	1	0
Herd Unit Total	1	0

MANAGEMENT EVALUATION

Current Mid-Winter Trend Count Management Objective: 225

Management Strategy: Median age of harvested bulls > 4.5yr; 50-70 bull/100 cows

2017 Trend Count = 110

Most Recent 3-year Running Average Trend Count = 116

Herd Unit Issues/Population

This population has experienced a general decline beginning in 1995. Trend counts via classification surveys showed a general upward trend from 2004 through 2010, an excellent year for detecting moose with near optimal snow cover and flight conditions. Starting in 2011, sample sizes have declined quite sharply, mostly due to less favorable snow cover and/or flight conditions. This year's trend count declined to 110 moose, with much less snow than in 2016. Flight conditions were generally favorable, but windy conditions prevented complete coverage of a few drainages in Area 2, resulting in a lower count than was observed in Area 30.

Moose, especially throughout the southern extent of their range, are susceptible to a variety of diseases, parasites, and other maladies. Presence of carotid artery worms (*Elaeophora schneideri*) has been increasingly documented in most herd units in Wyoming. However, no worms have been found in moose from the Lander Herd Unit recently. In fact, no presence of *Elaeophora* worms has been detected in this herd unit since it was first discovered in 1999 and 2000. At least 2 bull moose were found dead and tissues collected from fresh carcasses revealed low body condition, but no pathogenic problems were detected by the Wyoming State Veterinary Lab.

Attempts to develop a spreadsheet model for Lander Moose were not successful. In the absence of an accurate, or even usable, population estimate for the Lander Moose Herd Unit, a change to an alternative objective was necessary. Mid-winter trend counts, collected as classification survey data were deemed the best alternative, and seem to be a reliable trend indicator as we fly all available winter ranges annually. Therefore, the management objective was changed in 2013

to a trend count of 225 moose (range of 180-270 moose). The 2017 trend count was 110 moose, and the 3-year average of 116 moose is 51% below objective. The objective is currently under review for Lander Moose and we anticipate staying with the mid-winter trend objective at a lower number.

Field Data

Moose winter range trend count/classification surveys were conducted February 2018, in combination with elk classification and trend count surveys. All hunt areas were flown using a Bell 47 Soloy helicopter to survey traditional winter habitats throughout the herd unit. Most moose were observed in traditional willow riparian areas and adjacent sagebrush/bitterbrush slopes, or aspen stands. With poor snow cover in many moose habitats and our inability to find several moose associated with fresh tracks, it is apparent we missed a number of moose in the flight path. We were also unable to fly as thoroughly or at all in some drainages in Area 2, due to windy conditions, thereby potentially reducing the number of moose detected. The resultant 2017 trend count of 110 moose is below average (range 80-209) as shown in Figure 1.

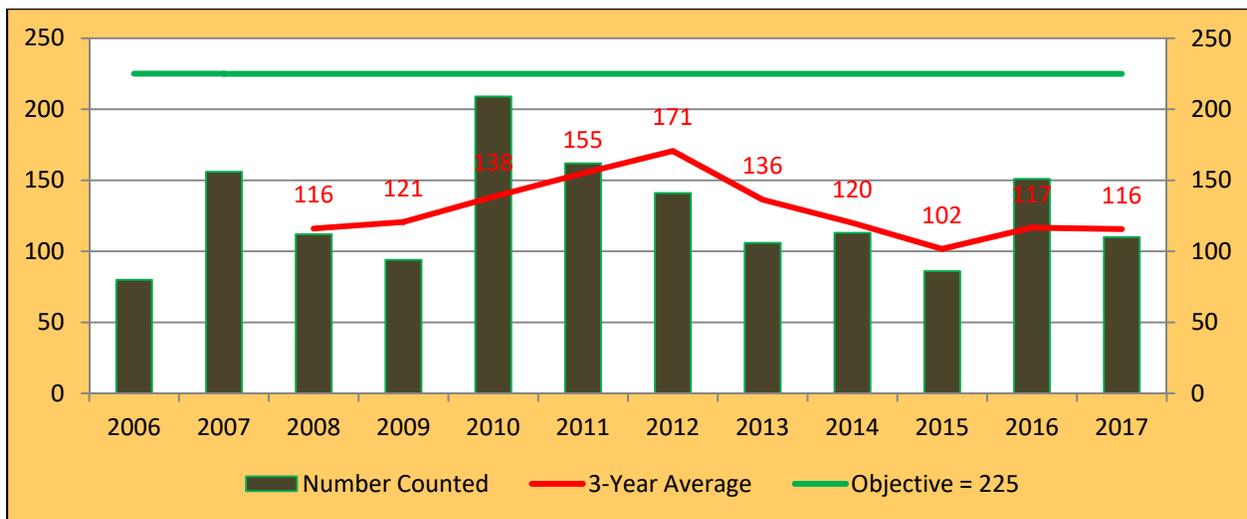


Figure 1. Lander Moose Herd Unit trend counts, 2006-2017.

Due to small numbers of moose observed, age and sex composition ratios have been quite variable since 1994 (Figure 2), with bull/cow ratios exhibiting wider variability than calf/cow ratios. The 2017 post-season calf/cow ratio increased to 48J/100F, and the bull/cow ratio increased to 63M/100F. Currently, calf/cow ratios are below levels observed in the 1990s, but have shown gradual improvement since 2007. Bull/cow ratios are widely variable, but have demonstrated a general upward trend since 1994, and have averaged about 60 bulls per 100 cows since 2006 (range 44 – 87), above the recommended minimum level of 50M/100F to assure an adequate number of males are available to breed receptive females, to provide prime age males in the social structure of the population, and to provide quality recreational opportunity, as per the Moose Working Group’s Population Management Recommendations (January 2008).

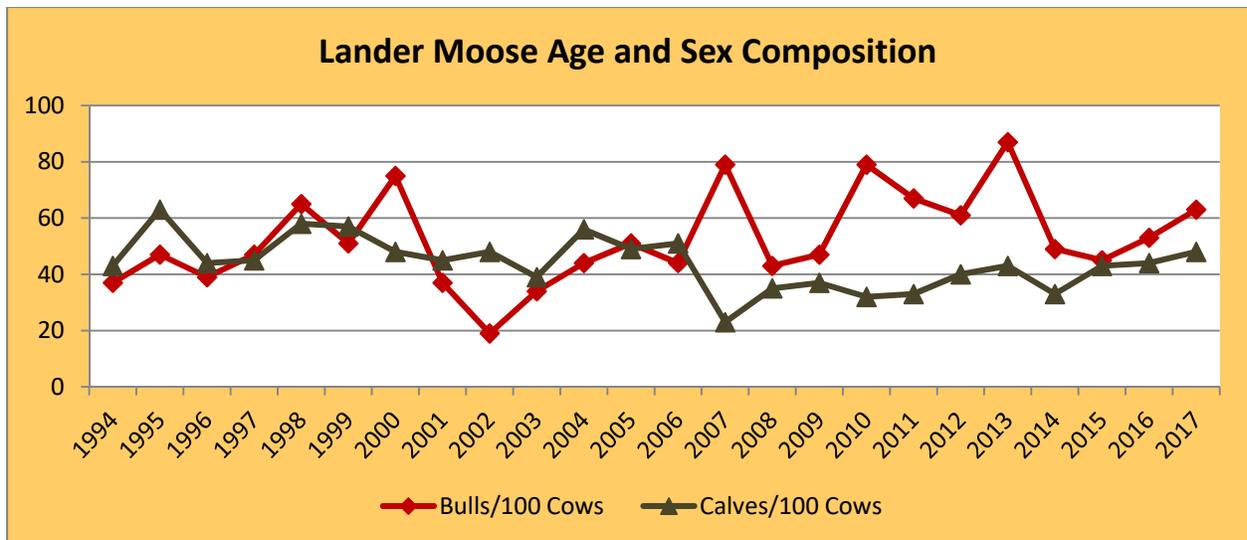


Figure 2. Age and sex composition for Lander Moose, 1994 – 2017.

Weather

Precipitation from October 2016 through September 2017 was markedly higher than the 30-year average. Heavy winter snows contributed the majority of the annual precipitation. Precipitation during the growing season (April-June 2017) was also higher than the 30-year average, while precipitation in high elevation spring-summer-fall ranges was slightly below the 30-year average. Most of the growing season (April-June) precipitation fell during April and May, which was followed by a dry, hot summer and a mild fall.

Winter 2017-18 has been characterized by warmer than average temperatures, with the temperature from November-February averaging 27 degrees Fahrenheit, which is considered above normal for this time period in the Lander Area. A mild fall gave way to a relatively mild winter. A total of 38.8” of snowfall has been recorded in Lander from November 2017-February 2018, 4.2” below the 30-year average. Below average snowfall and above average temperatures for Lander and the surrounding foothills is likely helping wildlife access forage and maintain body condition compared to the previous winter of continuous snow cover. However, less snow may negatively affect vegetation production during the coming growing season, if spring precipitation is also lacking. Snow water equivalents for the South Pass, Deer Park, and Townsend Creek SnoTel sites recorded February 15th, 2018 were 100%, 96%, and 96% of the official mean for those respective sites.

Habitat

Future management of Lander Moose will also include evaluation and monitoring of habitat conditions on key moose winter ranges. Habitat management and monitoring strategies are being deliberated by the Department’s Moose Working Group, and we are awaiting direction from them before moving forward with establishing transects.

Several rapid habitat assessments (RHA) were conducted in 2017, in shrub and aspen habitats. More RHAs will be conducted in the next 2 years, for a total of 10 each in shrub, aspen, and riparian habitats. Results of the 2017 assessments indicate shrub and aspen habitats are generally in late-seral states, with moderate to severe herbivory. Yet, plant species diversity was medium

to high for grasses, forbs, and shrubs, which is encouraging. However, the state and condition of shrubs and aspen are concerning, and will likely limit population growth and stability, especially in periods of drought.

Harvest Data

In 2017, 5 hunters harvested 5 moose, all in hunt area 2, for hunter success of 100%. The number of days per moose harvested increased to 13.8 days, and at least 2 hunters had difficulty finding moose throughout the season (although one hunter harvested the first bull found on October 1). According to the tooth aging report, teeth were submitted from all 5 bulls harvested. The median age of harvested bulls as measured via cementum annuli was 4.2 years (range 3 – 5 years). Hunters reported seeing 27 moose in 2017, a reduction from 2016, at least in part since there were only 5 licenses valid in both areas 2 and 30. Antler width averaged 35.4 inches (range 31 – 41 inches) for the 5 moose harvested.

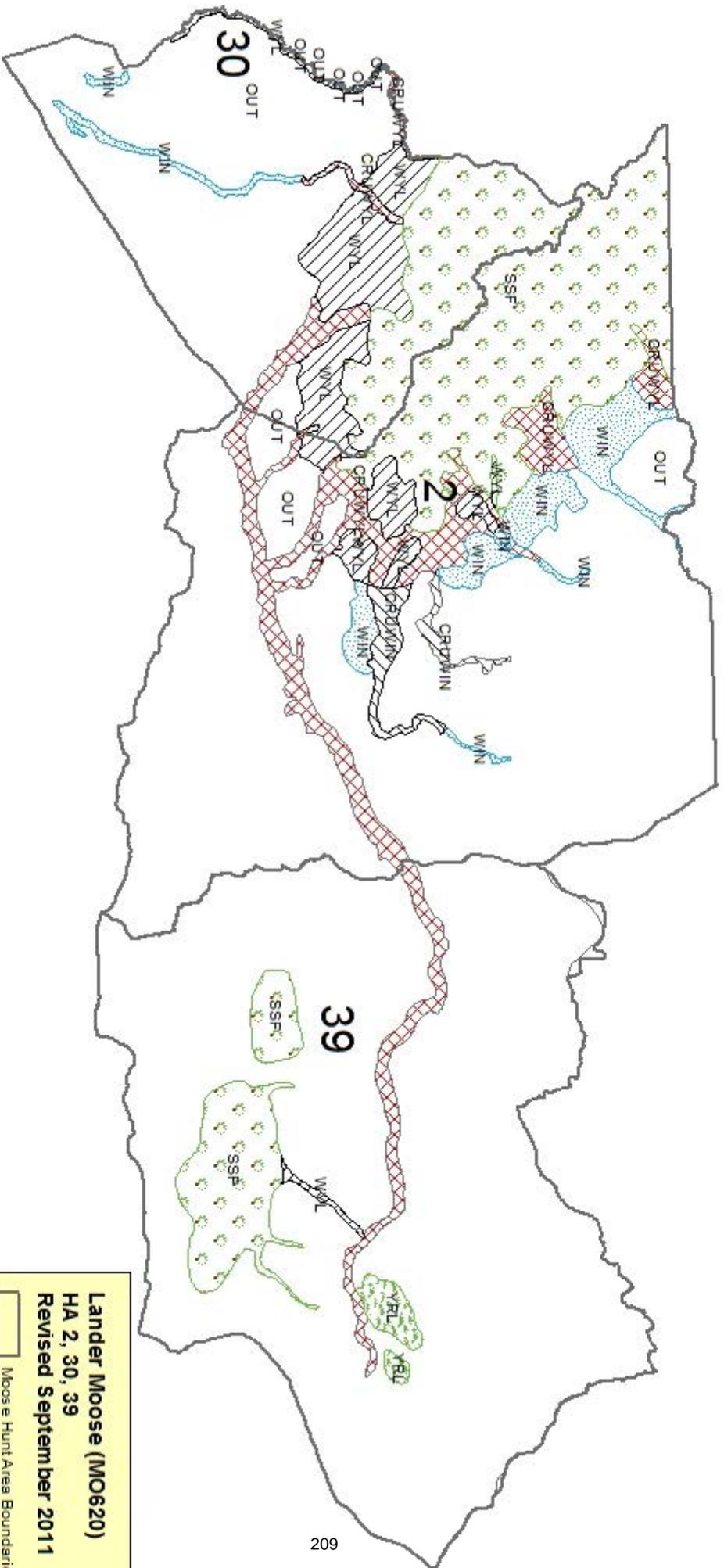
Management Summary

Due to concerns about overall moose population trend, we changed the season structure by combining both Hunt Areas 2 and 30 (while maintaining hunt area boundaries) into a single hunt opportunity. This seemed to work in 2017 with all 5 hunters harvesting moose, even if it took them a while to do so. This structure will continue in 2018, with no changes to license numbers with 5 Type 1 antlered moose licenses valid in both hunt areas concurrently for the entire season.

The 2018 season should provide a quality experience for moose hunters and improved hunter statistics. We expect hunter success to be 100%, resulting in a harvest of 5 bulls.

Lander Moose (MO620)
HA 2, 30, 39
Revised September 2011

	Moose Hunt Area Boundaries
	Moose Seasonal Range
	CRUWIN
	CRUWYL
	OUT
	SSF
	WIN
	WYL
	YRL



2017 - JCR Evaluation Form

SPECIES: Moose
 HERD: MO621 - DUBOIS
 HUNT AREAS: 6

PERIOD: 6/1/2017 - 5/31/2018

 PREPARED BY: GREG
 ANDERSON

	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:		N/A	N/A
Harvest:	5	5	5
Hunters:	5	5	5
Hunter Success:	100%	100%	100%
Active Licenses:	5	5	5
Active License Success:	100%	100%	100%
Recreation Days:	44	94	90
Days Per Animal:	8.8	18.8	18

Limited Opportunity Objective:

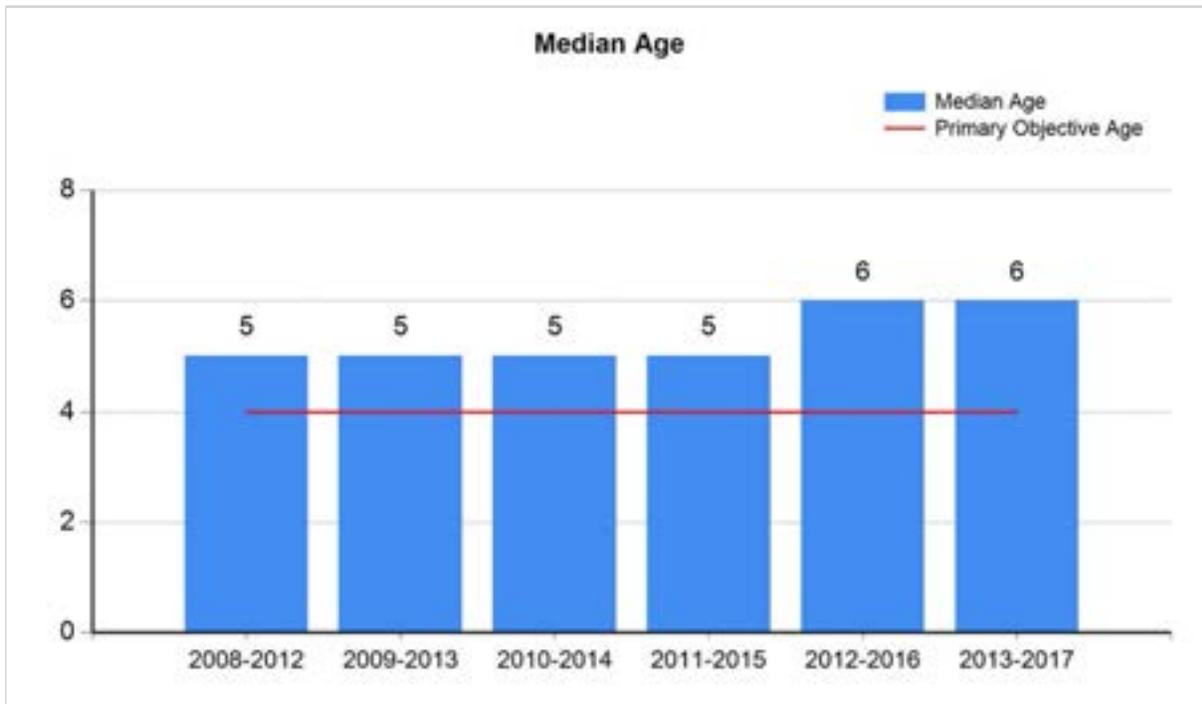
- 5-year running median age of harvested bulls is > 4 years
- 5-year running average of <= 10 days/animal to harvest

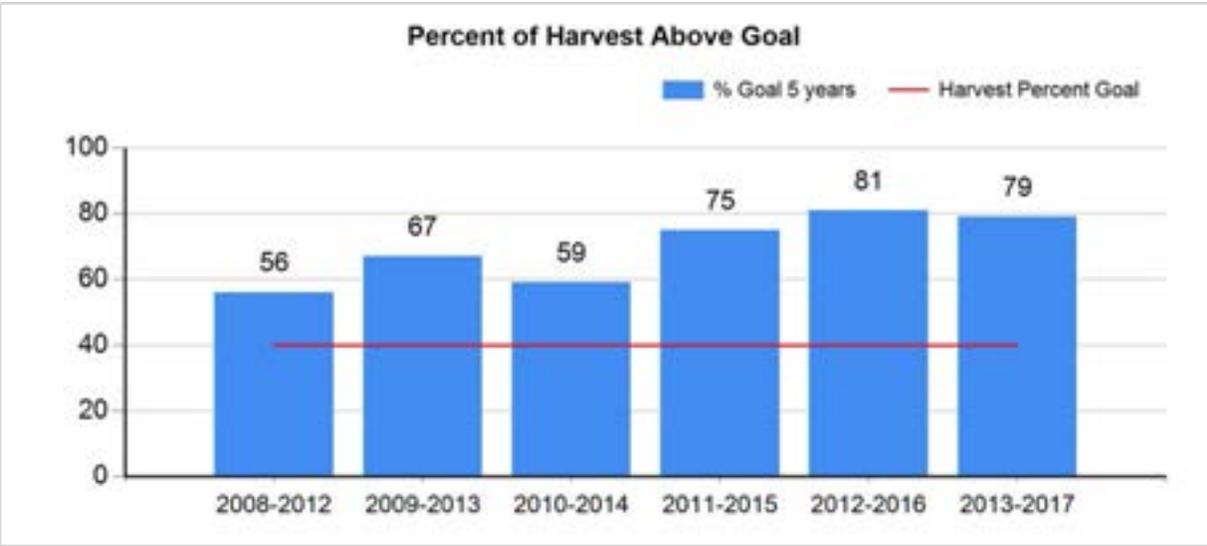
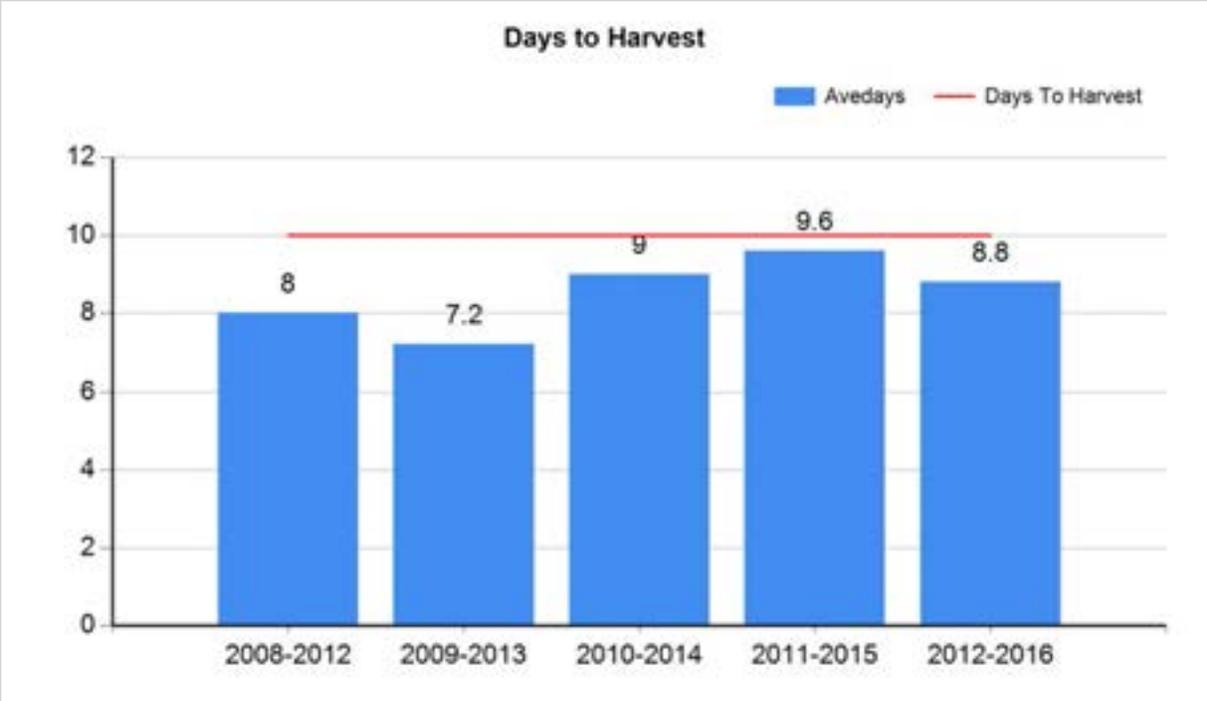
Secondary Objective:

- 5-year running average 40% of harvested bulls are > 5 years old

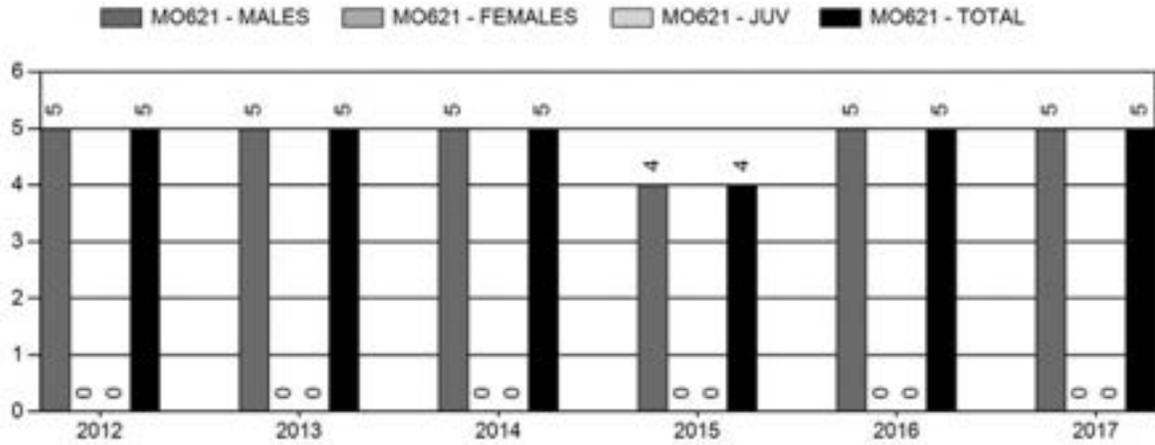
Management Strategy:

Special

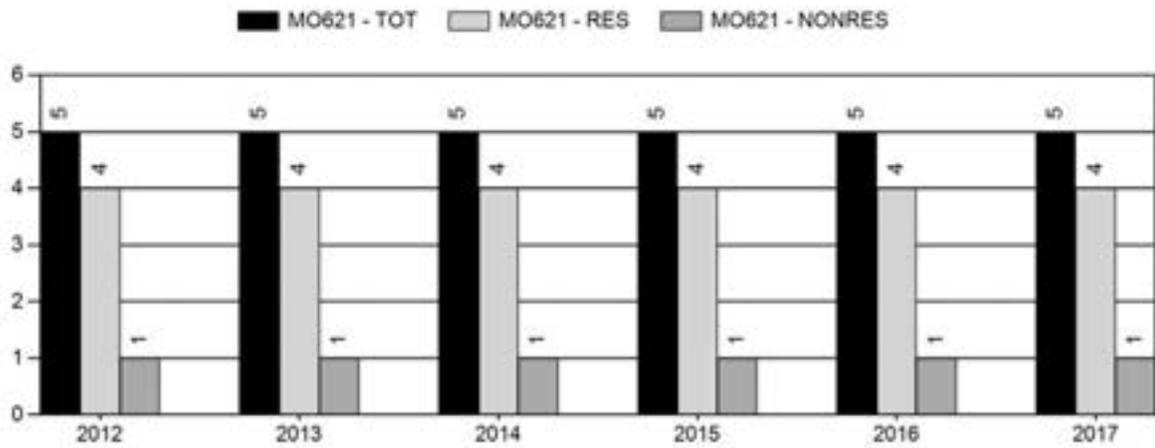




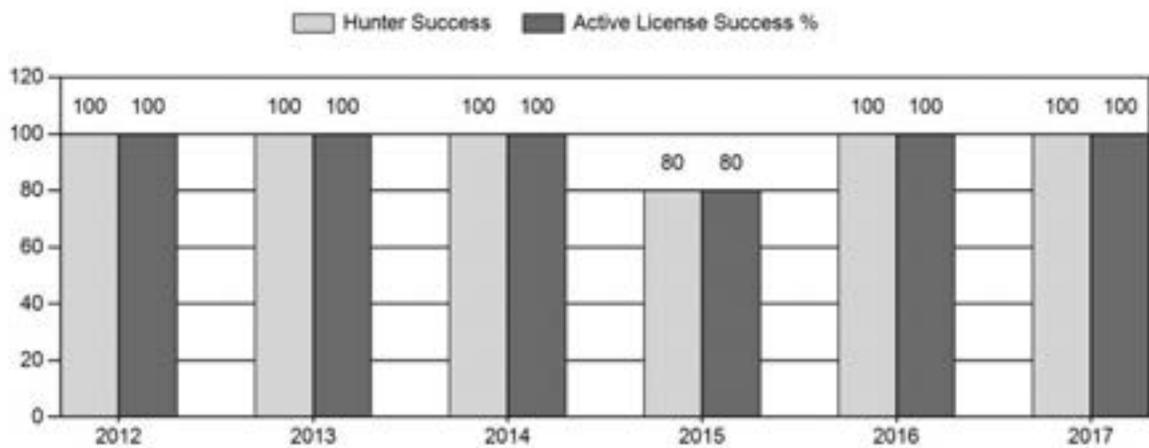
Harvest



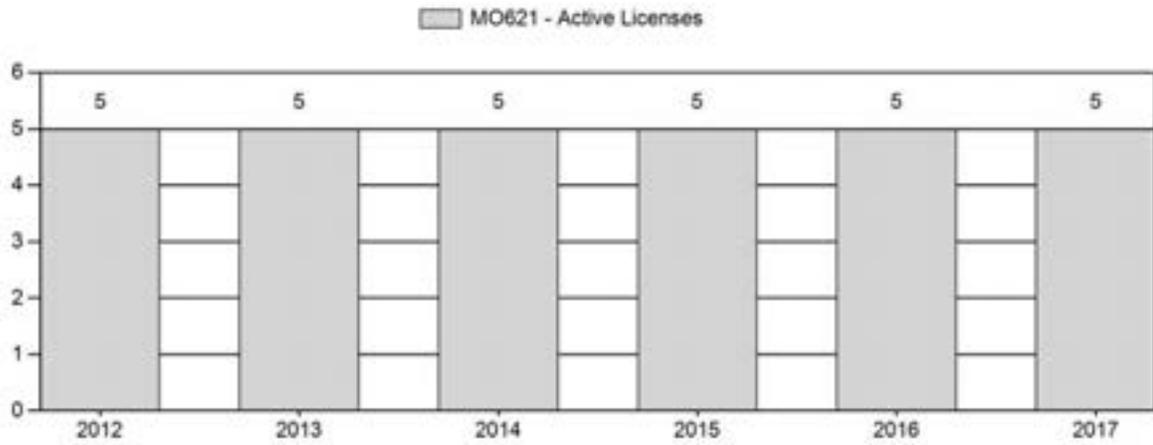
Number of Active Licenses



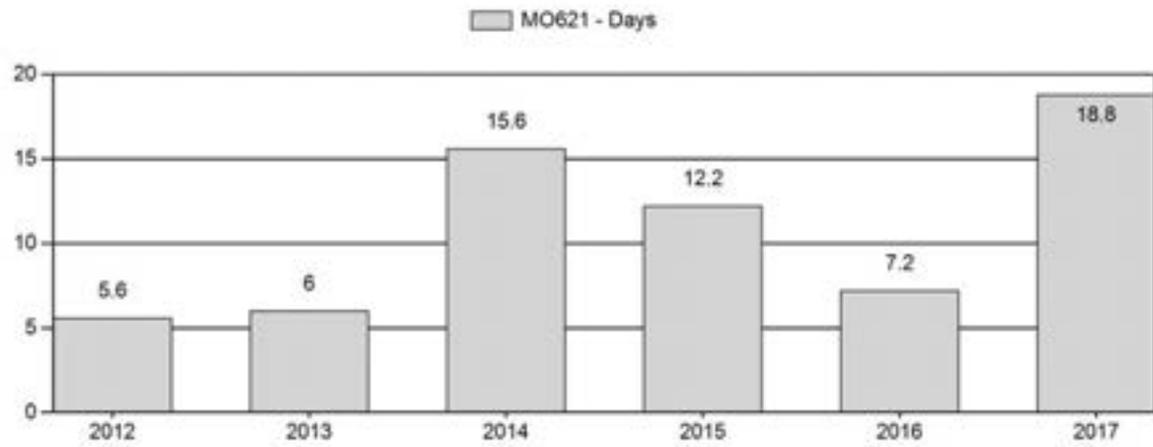
Harvest Success



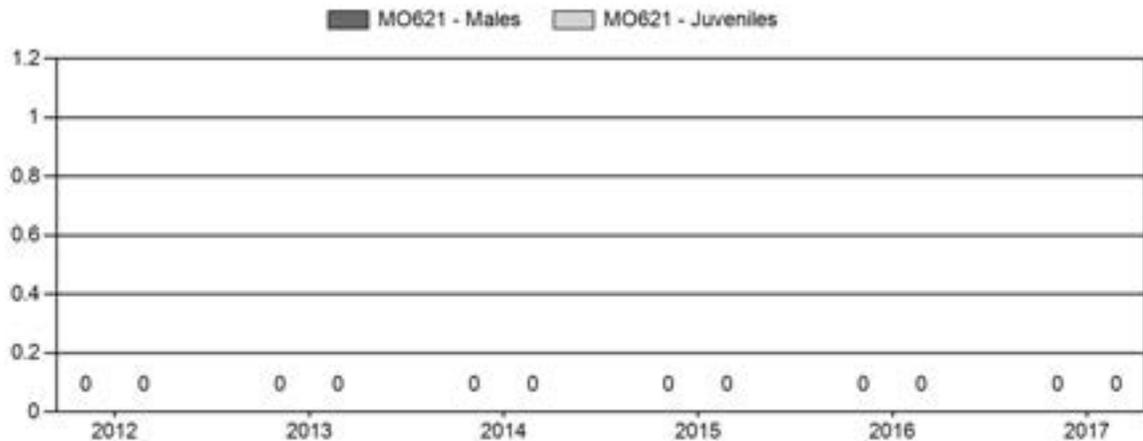
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



**2018 HUNTING SEASONS
DUBOIS MOOSE (MO 621)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
6	1	Oct. 1	Nov. 20	5	Limited quota	Antlered moose
Archery 6		Sep. 1	Sep. 30			Refer to section 2 of this chapter

Hunt Area	Type	Quota change from 2017
6		
Total		

Management Evaluation

Current Management Objective: Moose limited opportunity objective

Objective Status: At objective

Management Strategy: Special

Management Issues

In 2014, the management objective for the Dubois Moose Herd was changed to a ‘moose limited opportunity objective.’ This objective includes a list of several items to gauge the hunting experience in the herd unit and to ensure adequate recreational opportunity is maintained. The intent is to provide a small number of license holders a high quality experience. To this end, the Department aims to issue licenses such that:

1. The 5-year running median age of harvested bulls is ≥ 4 years.
2. The 5-year running average of the days/animal statistic for Type 1 license holders is ≤ 10 .
3. Department personnel document adult bulls in the herd unit each year.
4. 40% of harvested bulls are ≥ 5 years old for a 5-year running average.

Over the past 9 years, the Department has only issued 5 licenses in this herd unit annually. Since the objective criteria in the herd unit are dependent on harvest statistics and particularly tooth age data it can be problematic at times evaluating even these basic items. For example, only 1 set of teeth was submitted for age analysis in 2012 and only 2 sets were submitted in 2013. In 2017 all 5 hunters harvested moose and 3 submitted teeth for aging. In 2015, personnel began collecting

annual census data at 5 select moose wintering sites to document the presence of adult bulls in the population as well as providing a mechanism to identify major population changes.

Habitat/Weather

No specific data regarding moose habitat are collected within this herd unit on an annual basis. Vegetation monitoring transects on both sheep and elk winter range indicated herbaceous vegetation production was above average in 2017. Good moisture and growing conditions should have resulted in high feed production for moose on both low elevation winter sites and mid-elevation summer range. Moose observed throughout winter appeared to be in good body condition. It is likely this population has been and will continue to be impacted by large tracts of beetle killed timber across the herd unit as well as several large fires over the past decade. The effects of these natural successional changes should manifest themselves over the next decade. In summer, 2016 the Lava Mountain fire burned a significant amount of timber adjacent to moose winter range along the upper Wind River. This large burn will also result in more early seral stage vegetation on moose winter range.

Harvest Data/Population

Anecdotal evidence suggests this population declined significantly from two decades ago but has been stable over the past several years. Concurrent with the perceived decline, harvest pressure was reduced and the small amount of harvest data collected annually over the past 10 years has become less useful for making management decisions. In 2014, the Department adopted the ‘moose limited opportunity objective’ for use in herds like Dubois. This objective seeks to utilize the minimal amount of harvest data available to ensure herd health and hunt quality standards are met in small moose herds.

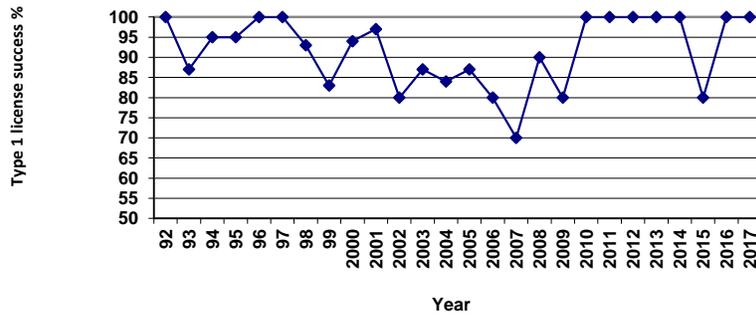
In 2017, Type 1 license holders had a 100% success rate in the Dubois Moose Herd Unit. Over the previous 5 years, Type 1 license success was 100% annually except in 2015 when success was 80% (Fig. 1). The days/animal was 18.8 in 2017 and was substantially higher than the 2016 figure of 7.2 as well as the five-year average of 11.98. It is unknown why the days/harvest was so high in 2017.

Given the 2017 harvest, the following conditions were met:

1. Five-year median age of bull harvest was 5.
2. Five-year average of days/animal was 11.98
3. Twenty-two bulls were classified in a sample size of 48 moose.
4. Over the past five years, 11 out of 17 (65%) of tooth aged, harvested bulls were 5 years or older.

As such, 3 of 4 objective criteria for the herd were met and the herd is considered at objective. Again, the reasons for the high days/animal statistic in 2017 are unknown, but with low license numbers, this statistic does tend to fluctuate substantially year-to-year. It should be noted, the current graphs produced by the JCR database program do not display the correct information for the objective criteria listed above. It is expected this will be corrected in the future.

Figure 1. Type 1 license success in the Dubois Moose Herd



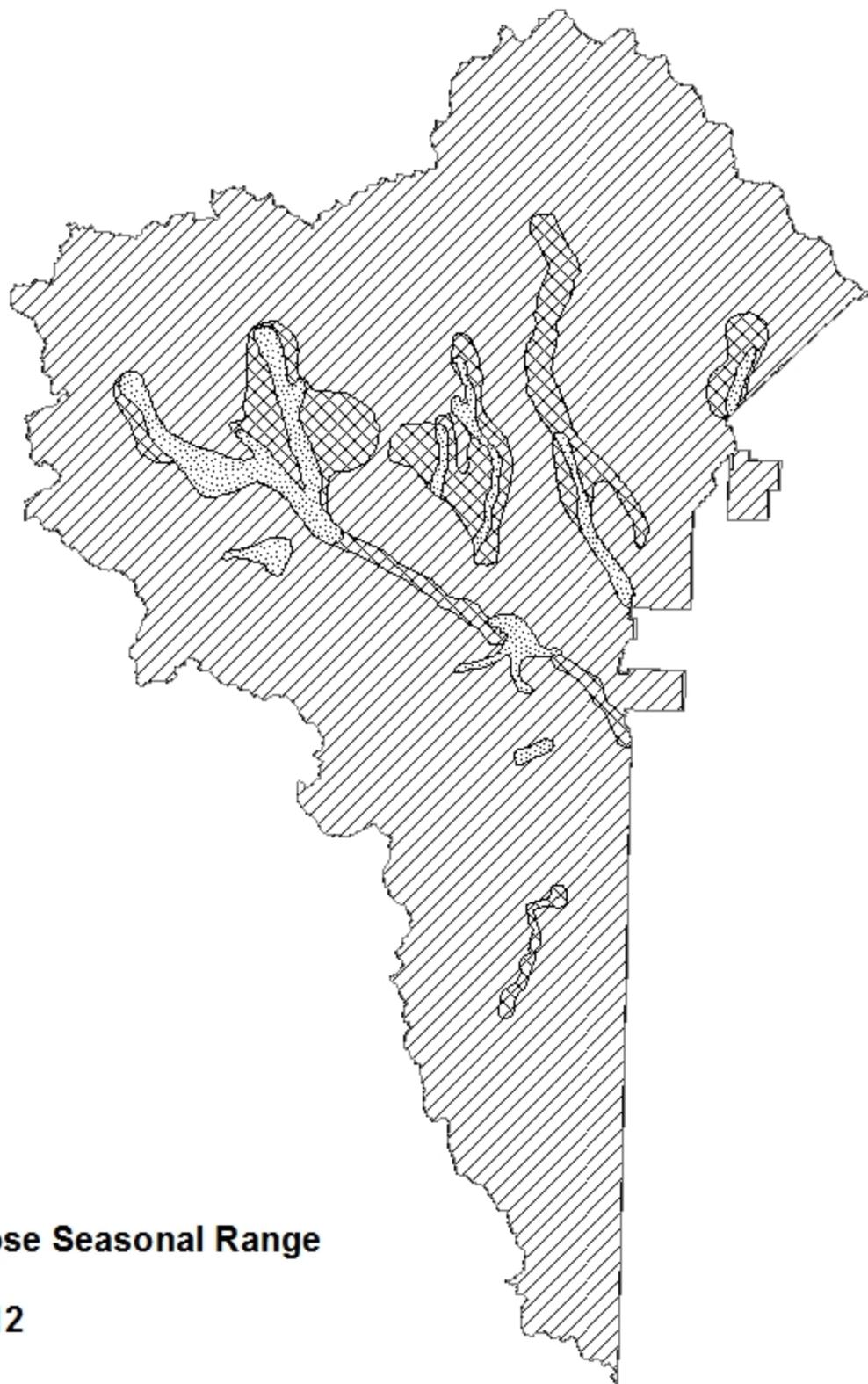
In January, 2015, personnel began counting moose at five distinct wintering areas within this herd unit (Table 1). These counts should provide a useful year-to-year comparison in the future. Significant population changes should be evident based on the presence of more or less moose at these sites. Additionally, monitoring these sites provides documentation of adult bulls in the population each year. Caution should be exercised when talking about these winter count numbers since slight distributional changes can result in significant count variation. That said, based on counts from the last 4 years, it appears the moose population in the herd is at least stable.

Table 1. Moose numbers at select wintering sites in the Dubois Moose Herd.

Location	2015		2016		2017		2018	
	Bulls	Total Moose	Bulls	Total Moose	Bulls	Total Moose	Bulls	Total Moose
East Fork Basin	1	6	4	9	3	6	8	21
Lower Horse Creek		3	4	4	1	1	2	5
Double Cabin		2	2	2	6	12	7	13
Upper Dunoir	4	10	5	11	5	7	4	6
Upper Wind River		8		3		5	1	3
Total	5	29	15	29	15	31	21	48

Management Summary

While hunter success has been high the past 5 years, there is little indication the moose population increased dramatically. A significant population increase should be indicated by greater moose numbers on key, highly visible winter ranges throughout the herd unit. Several years of data collection at the sites listed in Table 1 indicate a stable population with perhaps some growth in 2017. Given little information suggesting population growth in this herd unit the 2017 hunt season will remain unchanged with the issuance of 5 Type 1 licenses.



**Dubois Moose Seasonal Range
Hunt Area 6
Revised 2012**

-  CRUWYL
-  SSF
-  WYL

