

2013 - JCR Evaluation Form

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

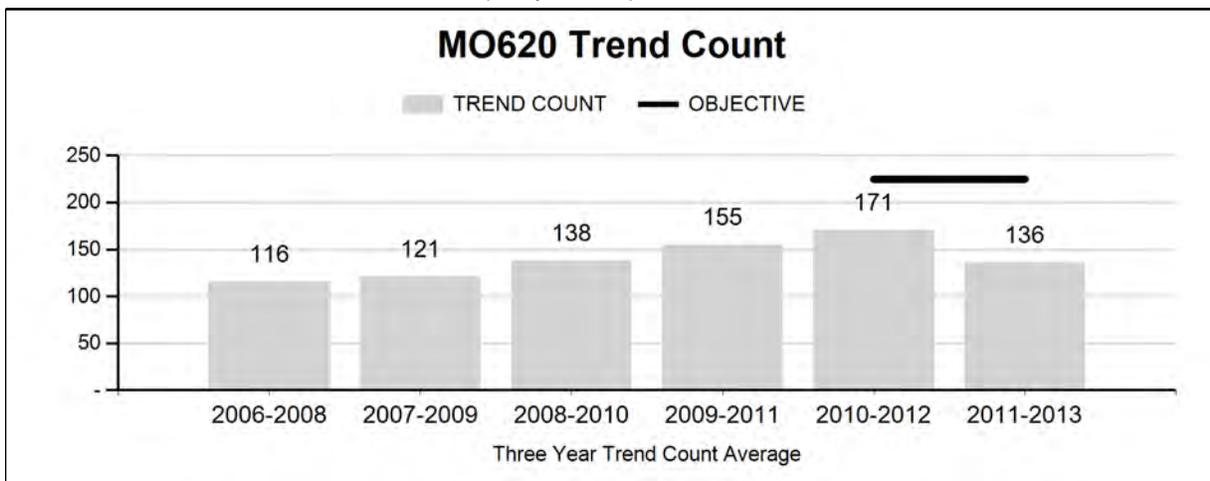
PERIOD: 6/1/2013 - 5/31/2014
 PREPARED BY: STAN HARTER

	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Trend Count:	144	106	180
Harvest:	9	7	10
Hunters:	11	9	10
Hunter Success:	82%	78%	100%
Active Licenses:	11	78%	10
Active License Percentage:	82%	78%	100%
Recreation Days:	94	107	130
Days Per Animal:	10.4	15.3	13
Males per 100 Females:	62	87	
Juveniles per 100 Females	35	43	

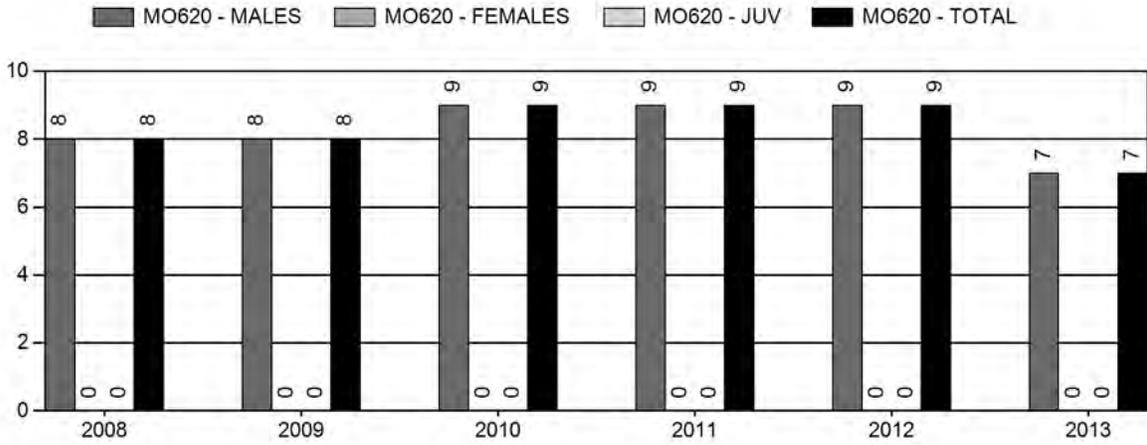
Trend Based Objective ($\pm 20\%$) 225 (180 - 270)
 Management Strategy: Special
 Percent population is above (+) or (-) objective: -52.9%
 Number of years population has been + or - objective in recent trend: 3

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

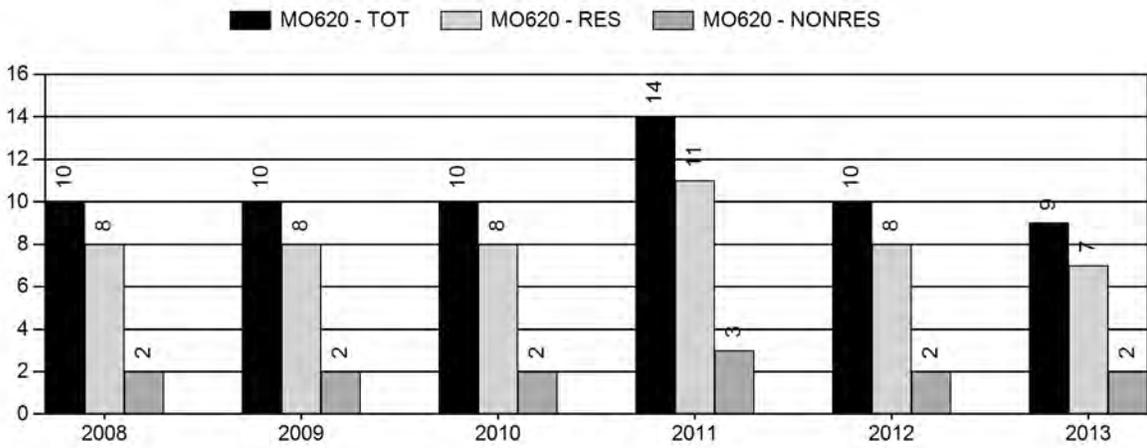
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



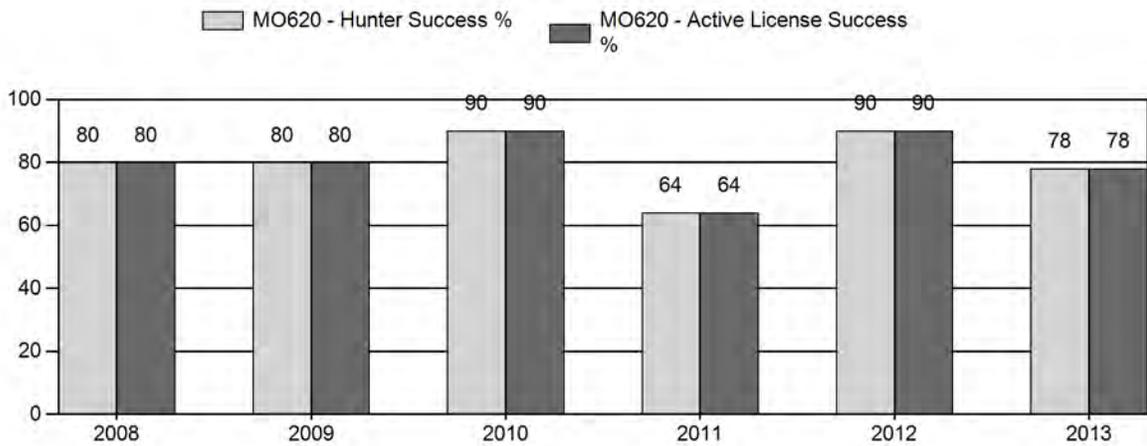
Harvest



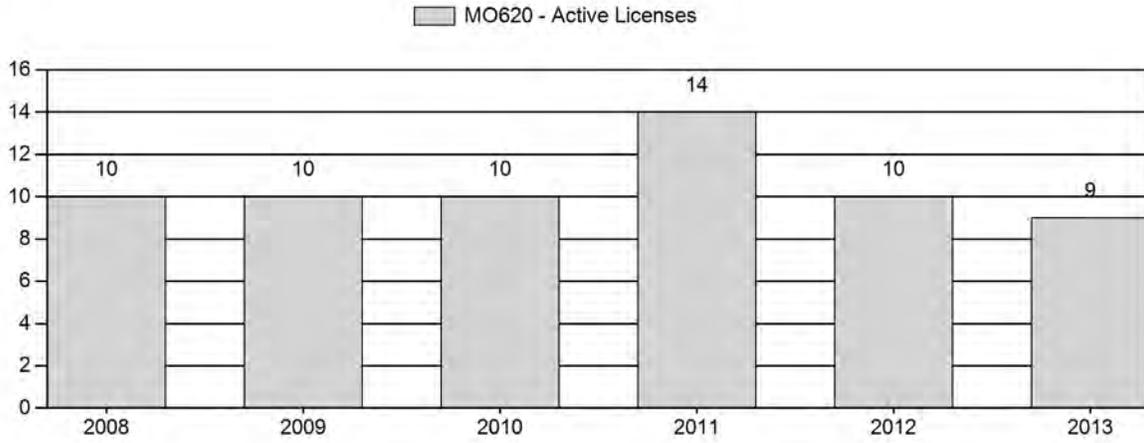
Number of Hunters



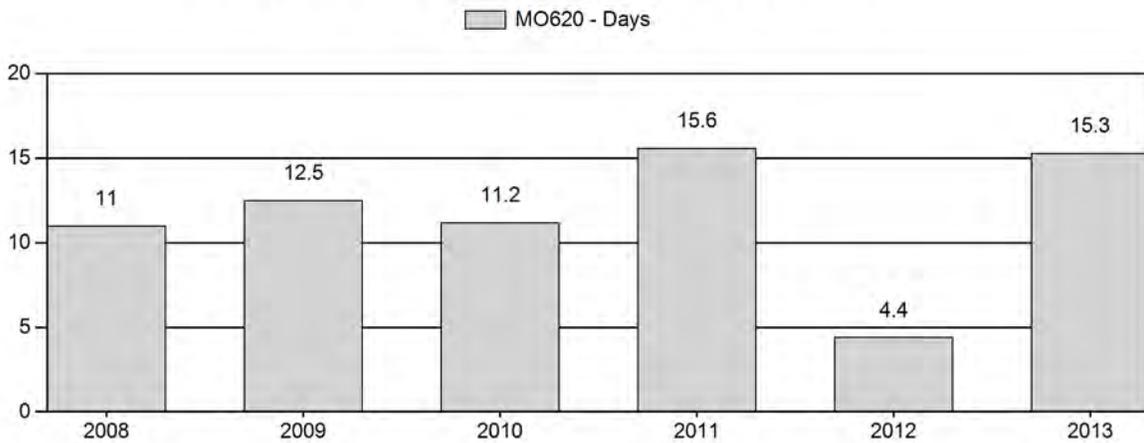
Harvest Success



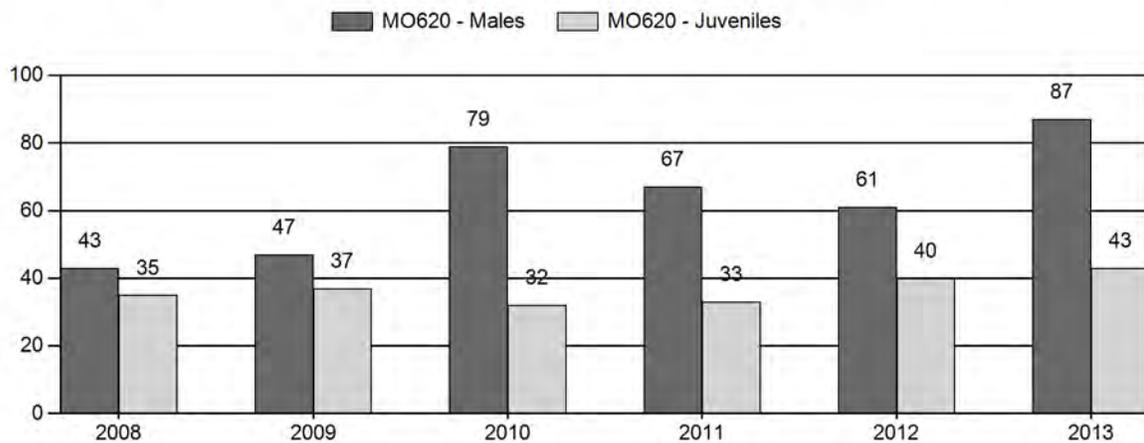
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 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
2008	0	0	0	27	24%	63	56%	22	20%	112	220	0	0	43	± 10	35	± 9	24
2009	0	0	0	24	26%	51	54%	19	20%	94	234	0	0	47	± 13	37	± 11	25
2010	0	0	0	78	37%	99	47%	32	15%	209	281	0	0	79	± 9	32	± 5	18
2011	0	0	0	54	33%	81	50%	27	17%	162	263	0	0	67	± 11	33	± 7	20
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 HUNTING SEASONS
Lander Moose Herd Unit (MO 620)

HUN T AREA	TYP E	Season Dates		Quot a	LIMITATIONS
		OPENS	CLOSE S		
2	1	Oct. 1	Nov. 20	5	Limited quota; antlered moose
30	1	Oct. 1 Nov. 1	Oct. 31 Nov. 20	5	Limited quota; antlered moose Unused Area 30 Type 1 licenses also valid in Area 2
39		CLOSE D			

MANAGEMENT EVALUATION

Current Management Objective: Mid-winter Trend Count = 225

Management Strategy: 60-70 bull/100 cows

2013 Trend Count = 106

Most Recent 3-year Running Average Trend Count = 136

Herd Unit Issues/Population

This population has experienced a general decline beginning in 1995. Recent trend counts show a general upward trend since 2004, peaking in 2010, an excellent year for detecting moose with near optimal snow cover and flight conditions. Starting in 2011, sample sizes have declined rather sharply, due in part to less favorable snow cover and/or flight conditions. While this decline is possibly only the result of reduced detection of moose, it may also indicate a real decline in moose numbers. Calf/cow ratios are seemingly on the rise, but with such small sample sizes, this statistic could be misleading, especially in light of several hunters and other members of the public and Department reporting seeing few cow moose with calves at their sides the past few years.

Moose throughout 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 recently. However, moose from the Lander Herd Unit were sampled for this parasite in fall 2013, with no worms found. In fact, no presence of *Elaeophora* worms has been detected in this herd unit since it was first discovered in 1999 and 2000. A homeowner on the south end of Limestone Mountain reported a cow moose with a prolapsed uterus. The cow was euthanized due to her severely deteriorated body condition from a systemic infection. Her surviving calf was captured and transported to the Tom Thorne/Beth Williams Wildlife Research Center at Sybille to aid in research about carotid artery worms. No confirmed cases of winter ticks have been reported in bio-year 2013, but most cases of winter ticks don't manifest themselves until late winter or early spring, as was the situation with 2 cases identified in April/May 2013. Another dead cow moose was found along the Middle Fork of the Popo Agie River in June 2013, with winter ticks being a possible cause of death.

Attempts to develop a spreadsheet model for Lander Moose were not successful. All iterations of the Spreadsheet Model result in either unsubstantiated population trends or somewhat reasonable trends, but exaggerated population size. Also, the model with the most reasonable trend (TSJ/CA) has almost all juvenile survival estimates at the upper or lower thresholds, leaving doubt as to the model's true ability to estimate this moose population accurately. 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. The most reasonable alternative objective is one based on winter trend counts (collected as classification survey data, which we believe 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).

Field Data

Moose winter range trend count/classification surveys were conducted in combination with elk and deer classifications, using a Bell Jet Ranger helicopter along the Sweetwater River and major streams along the southern Wind River mountains. Personnel from the Pinedale Region flew Area 30 west of the Sweetwater River with Savage Air's Bell 47 Soloy helicopter. Most moose were observed in traditional willow riparian areas or aspen stands. However, due to very light snow cover in most of Area 2 and increasing winds affecting flight safety, we did not observe as many moose as we anticipated in several locations, particularly in the Middle Popo Agie drainage, Maxon Basin, Pass Creek burn, and Limestone Mountain areas. The total classification sample of 106 moose was 18% below the average since 2004. The observed post-season calf/cow ratio of 43J/100F was the highest observed since 2006 and the observed bull/cow ratio of 87M/100F was the highest since 1994. Due to a low number of cows in the sample (the lowest since 2006), both ratios fluctuated more widely than did the actual number of calves or bulls. This is a common issue for this herd unit, with very low sample sizes even in "good" years.

Weather/Habitat

Drought conditions were extreme to exceptional for most of the past two years, beginning with minimal snowfall in winter 2011-12 and continuing with almost no precipitation during spring and summer 2012. In April 2013, a series of several late winter/early spring snow storms produced over 50" of snow through early May (the equivalent of nearly 4" precipitation) in Lander, with more snow reported in Sinks Canyon (up to 78") and other locations along the east slope of the Wind River Range. These storms were extremely helpful in lessening the effects of drought, yet they only helped change the drought status from Extreme to Severe. Drought returned in summer 2013, with only 0.34 inches of precipitation recorded in Lander from June 1 to September 1. This reduced forage production in herbaceous and browse species across the herd unit, although some improvement over 2012 conditions was noted. Rain and snow returned to the area in September and October 2013, with as much as 300% of normal precipitation recorded in Lander with warm temperatures between early storms. This led to improvement in vegetation condition, primarily grasses. In spite of fairly mild winter conditions in 2013-14, some winter mortality is expected due to the poor condition of winter range habitats following long-term drought.

Future management of Lander Moose will also include evaluation and monitoring of habitat conditions on key moose winter ranges. Willow transects were measured in fall 2013, to attempt gauging moose winter habitat use and condition. A modified live/dead (LD) index was initiated at 2 of the transect sites previously monitored by Hanna, et al. (1989). However, the amount of time required to conduct the modified LD monitoring seems excessive and alternatives are being considered. Additional transects will be established to detect winter habitat use in areas such as the Pass Creek Burn of 2002 and elsewhere if necessitated by recent updates to seasonal ranges.

Harvest Data

Hunter success declined to 78% in 2013, but average age and antler width of harvested bulls, along with numbers of moose reported by moose and elk hunters, has generally improved over recent years, especially in Hunt Area 2. In 2013, nine hunters harvested 7 moose, and the number of days per animal harvested more than tripled to 15.3 days. Possibly due to more time spent in the field by each hunter, the number of moose observed by hunters nearly doubled in 2013 to 80, 47 in Area 2 and 33 in Area 30.

According to the tooth aging report, teeth were submitted from only 4 harvested bull moose, with average age via cementum annuli at 5.5 years (range 3.5 – 9.5 years). This increased over that of the past several seasons. Antler width averaged 41 inches (range 34 – 48 inches).

Management Summary

Hunting seasons remain conservative in 2014 with 5 Type 1 Antlered Moose licenses in Hunt Area 2 and with 5 Type 1 licenses in Hunt Area 30. The bull/cow ratio has been increasing in recent years, but with low calf/cow ratios (average of 35/100 since 2006, range 32 – 43; average was 47/100 from 1980 to 2006, range 24 – 63) and lower trend counts, we don't believe this population can yet sustain an increase in bull harvest. Hunter success has averaged 80% in the past several years, in spite of increases in bull/cow ratios. When we increased the number of Type 1 licenses from 10 to 15 in 2011, hunter success dropped to 64% and days per harvest increased to 15.6. Since the actual number of bulls observed in 2013 was just over half that observed in 2010 prior to raising license numbers, we don't believe the elevated bull/cow ratio is an indicator of dramatic rises in the overall number of bulls in the population.

Given relatively poor detection of moose, it is likely the actual number of moose is much higher than that observed in the 2013 classification/trend survey. Regardless, the population is still experiencing an increasing trend since 2004 (Figure 1). However, decreasing counts since 2010 cause concern this population may once again be declining.

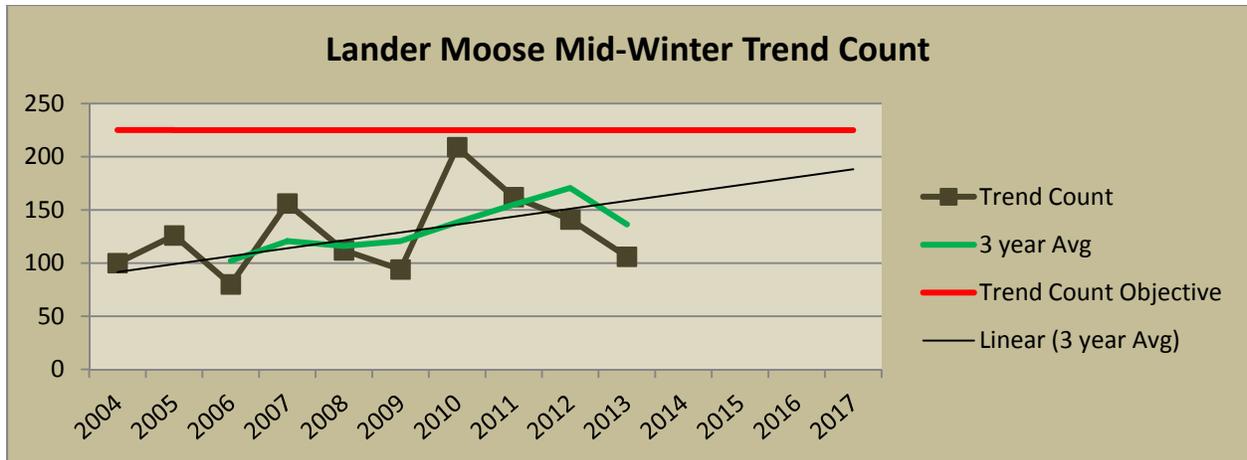


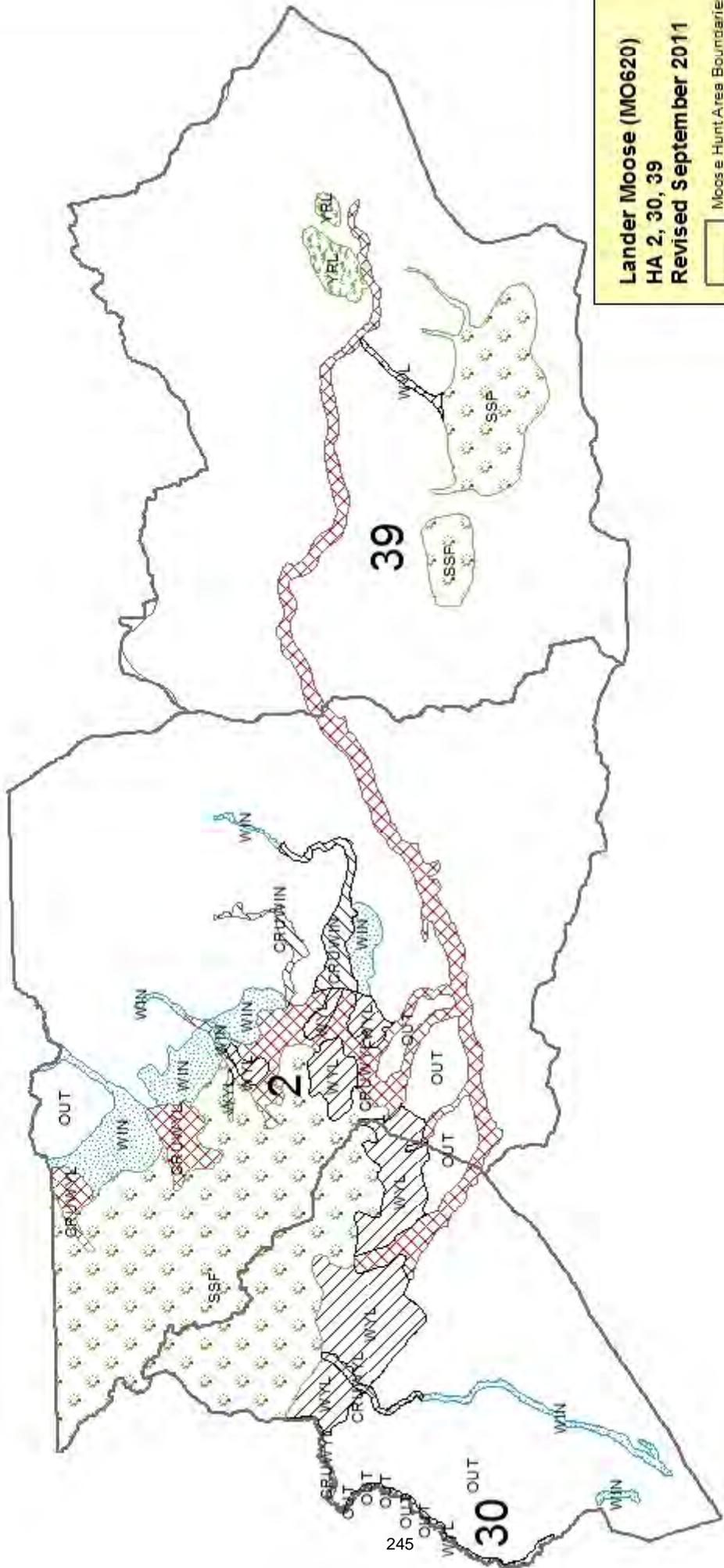
Figure 1. Mid-winter trend count data for Lander Moose (2004-2013) with projected trend through 2017 based on 3-year running average.

In response to hunters reporting difficulty in finding and harvesting moose in Area 30 in recent years, Area 30 hunters continue to be allowed to hunt in Area 2 after November 1, if they are unsuccessful in Area 30 during October. This was done the past 2 seasons, but none of the Area 30 hunters have actually hunted in Area 2.

The 2014 seasons should provide a quality experience for moose hunters following increased bull/cow ratios and improved hunter statistics. We expect hunter success to be 100%, resulting in a harvest of 10 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



2013 - JCR Evaluation Form

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

PERIOD: 6/1/2013 - 5/31/2014

 PREPARED BY: GREG
 ANDERSON

	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	0	N/A	N/A
Harvest:	5	5	5
Hunters:	6	5	5
Hunter Success:	83%	100%	100 %
Active Licenses:	6	5	5
Active License Percent:	83%	100%	100 %
Recreation Days:	40	30	35
Days Per Animal:	8	6	7
Males per 100 Females	34	0	
Juveniles per 100 Females	16	0	

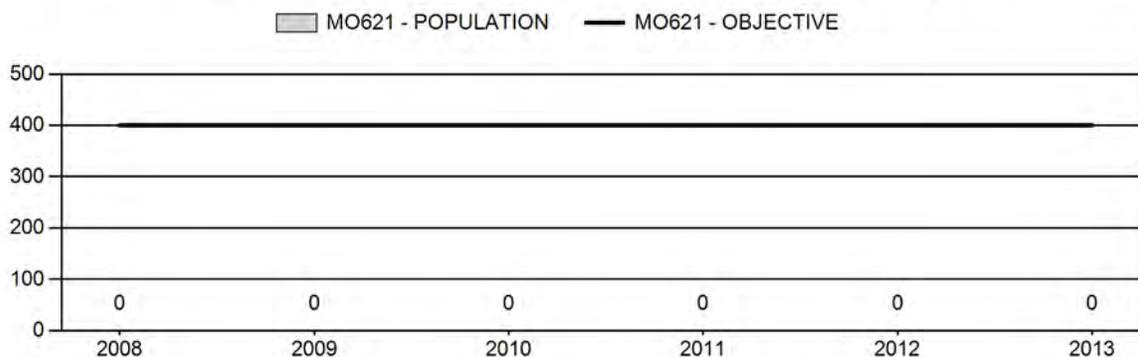
Population Objective: 400
 Management Strategy: Special
 Percent population is above (+) or below (-) objective: N/A%
 Number of years population has been + or - objective in recent trend: 0
 Model Date: 1/1/2014

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

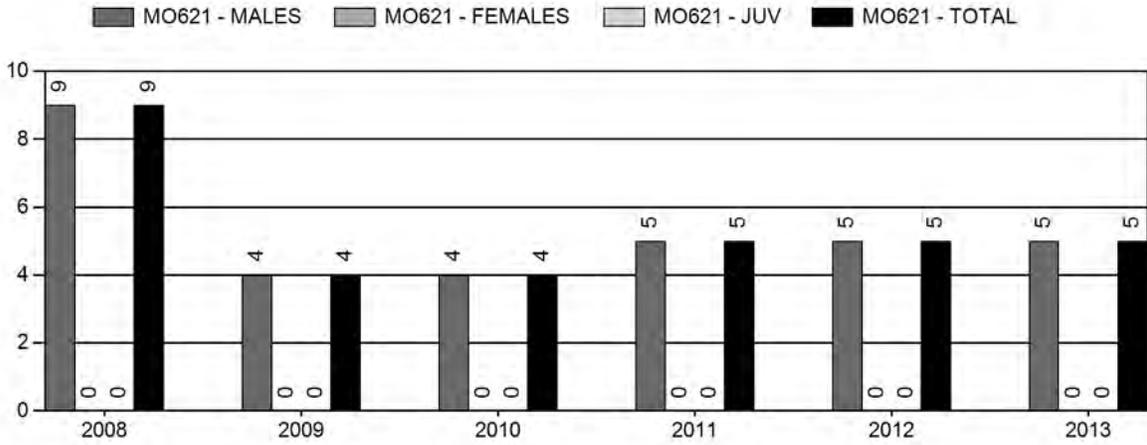
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%
Total:	0%	0%

Proposed change in post-season population: 0% 0%

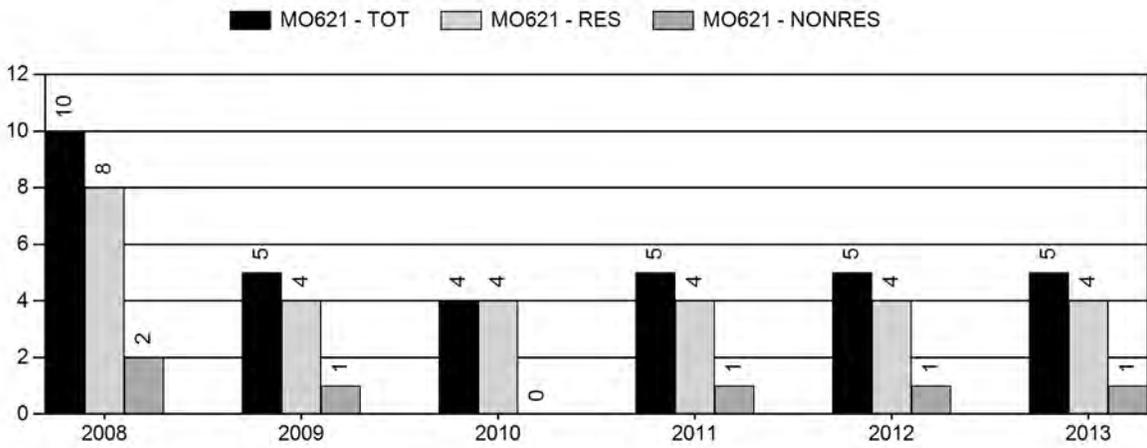
Population Size - Postseason



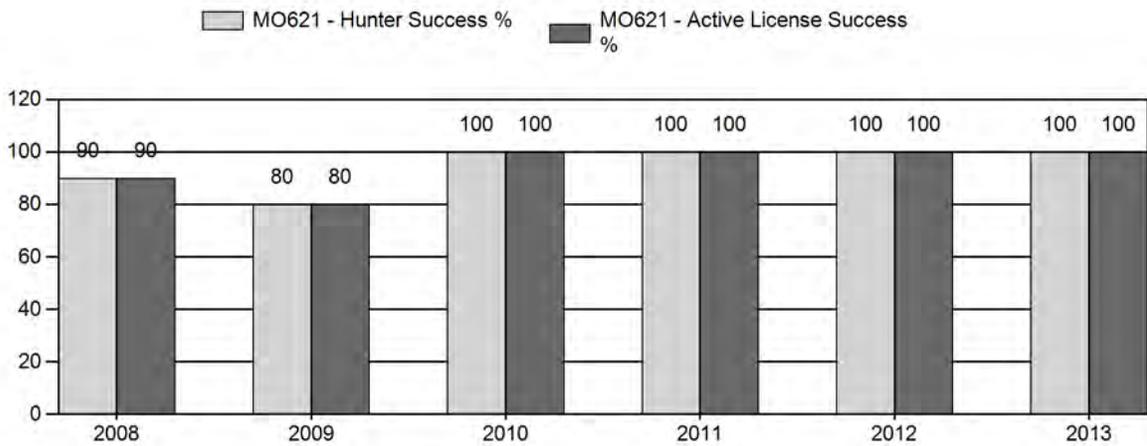
Harvest



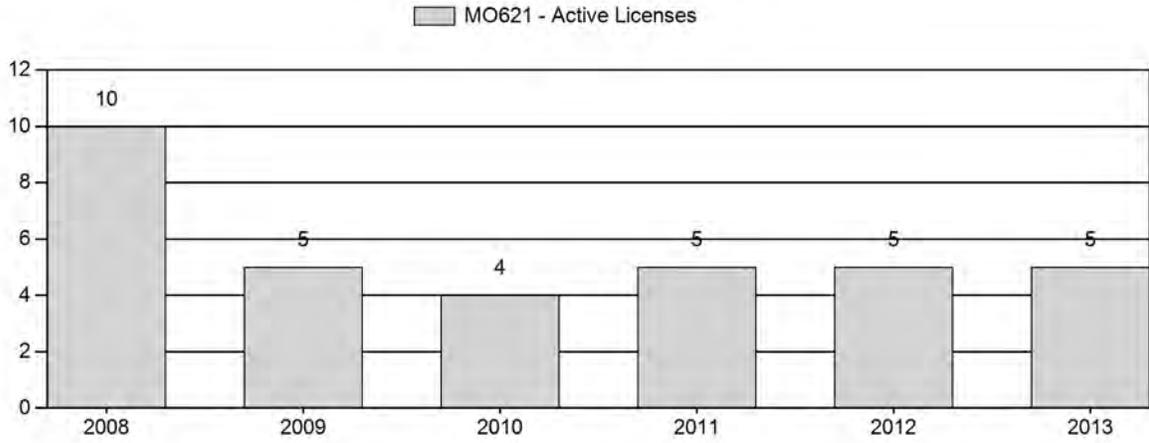
Number of Hunters



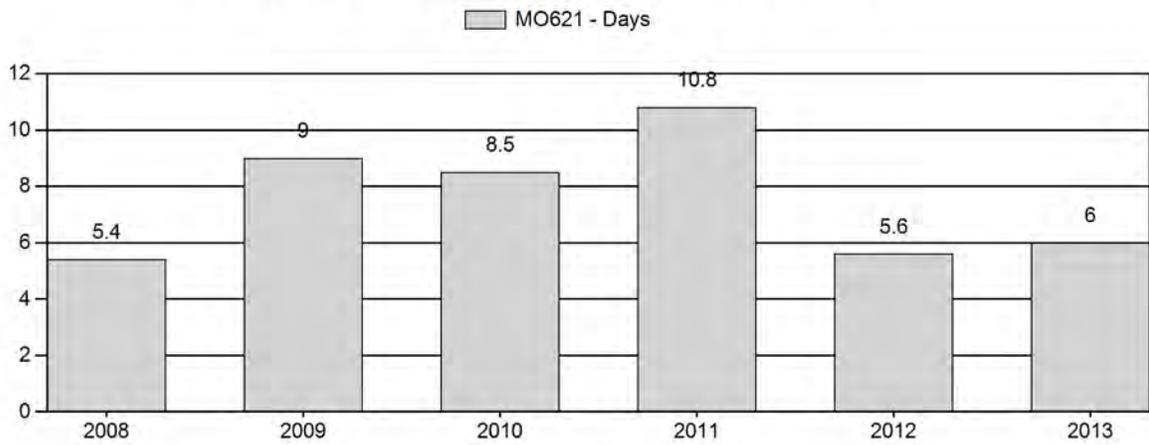
Harvest Success



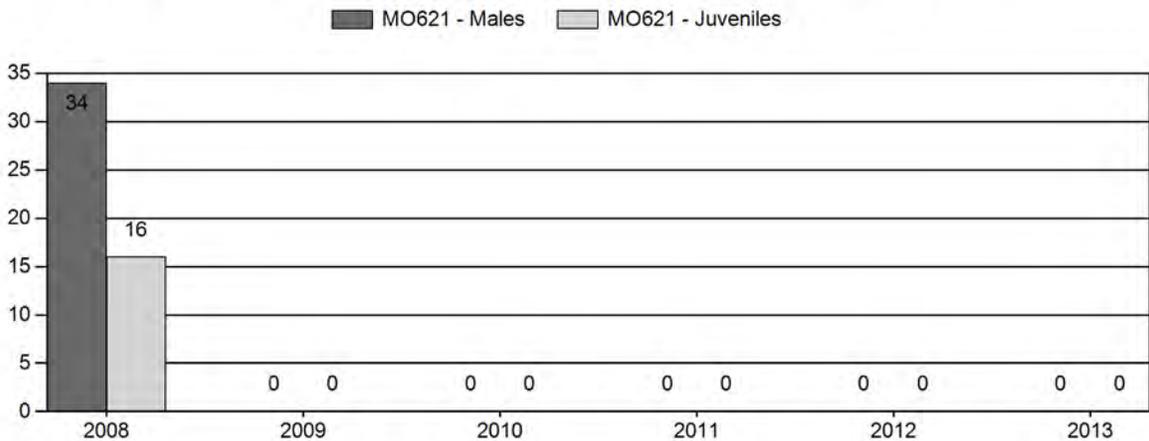
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Moose Herd MO621 - DUBOIS

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	0	0	0	21	23%	61	66%	10	11%	92	0	0	0	34	±0	16	±0	12
2009	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2010	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2011	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2012	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2013	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0

**2014 HUNTING SEASONS
DUBOIS MOOSE (MO 621)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
6	1	Oct. 1	Nov. 20	5	Limited quota; antlered moose
Archery		Sep. 1	Sep. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
6		
Total		

Management Evaluation

Current Management Objective: 400

Management Strategy: Special

2013 Postseason Population Estimate: unknown

2014 Proposed Postseason Population Estimate: unknown

Management Issues

The Dubois moose herd has a population objective of 400 and a special management designation. The objective has been in place since 1994. Despite having a numerical objective, the herd has never been modeled effectively and no model has been constructed over the past 10 years due to the lack of demographic data. Given the low density of moose in the herd unit, managers essentially stopped collecting demographic data over the past several years. To maintain a small amount of data useful in analyzing long term population trends, managers plan to establish winter count areas at several sites with historically higher wintering moose densities.

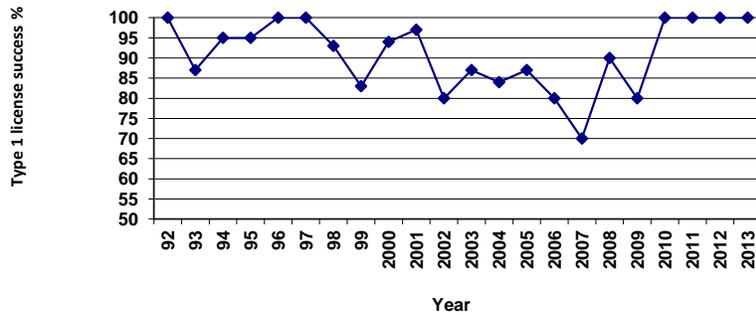
Habitat/Weather

The 2013 bio-year was characterized by extreme drought in this herd unit. Vegetation growth on both low elevation winter sites and mid-elevation summer range is thought to have been below average based on personnel observations. The moose population should have been somewhat buffered from the drought due to the extensive amount of habitat occupied by very low moose densities. It is likely this population has been and will continue to be impacted by large tracts of beetle killed timber across the herd unit over the past several years. The effects of this natural successional change should manifest themselves over the next decade.

Harvest Data/Population

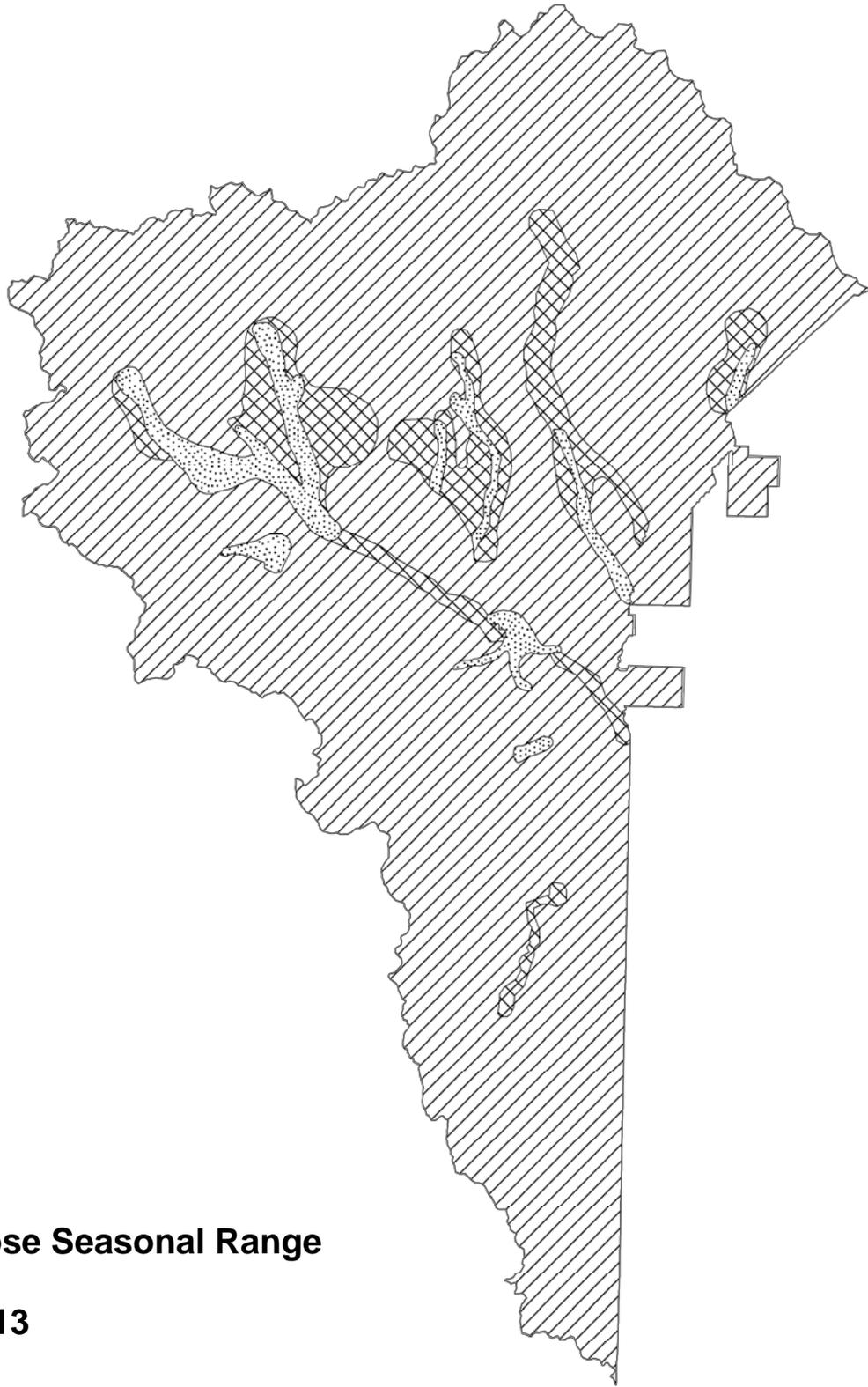
Anecdotal evidence suggests this population declined significantly over the past decade. As the population declined it became progressively more difficult and expensive to collect a reasonable amount of demographic data. Concurrently, harvest pressure was reduced and the small amount of harvest data collected annually became less useful for making management decisions. The Department has not actively managed this herd for a number of years due to the lack of demographic data and the cost prohibitive nature of collecting an appropriate amount of classification data. Instead, personnel have used anecdotal information as well as Type 1 license success data to formulate hunt season recommendations. For the past 4 years an appropriate amount of recreational opportunity has been provided by issuing 5 Type 1 licenses annually. The reduction to 5 Type 1 licenses occurred in 2009 in response to declining success on Type 1 licenses over the previous decade (Fig. 1). Success on the Type 1 licenses has been 100% each of the last 4 years including 2013.

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



Management Summary

While hunter success has been high the past 4 years, there is no 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. Department personnel have not noticed or received public comments to suggest an increase in moose numbers on winter range. Given no anecdotal information suggesting population growth in this herd unit, the 2014 hunt season will remain unchanged with the issuance of 5 Type 1 licenses.



**Dubois Moose Seasonal Range
Hunt Area 6
Updated 2013**

-  CRUWYL
-  SSF
-  WYL



