

## 2013 - JCR Evaluation Form

SPECIES: Moose

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

HERD: MO105 - SUBLETTE

HUNT AREAS: 3-5, 10, 20-25

PREPARED BY: DEAN CLAUSE

	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Trend Count:	1,193	1,400	1,400
Harvest:	245	208	205
Hunters:	277	228	230
Hunter Success:	88%	91%	89%
Active Licenses:	277	91%	230
Active License Percentage:	88%	91%	89%
Recreation Days:	2,016	1,694	1,650
Days Per Animal:	8.2	8.1	8.0
Males per 100 Females:	63	65	
Juveniles per 100 Females	40	42	

Trend Based Objective (± 20%) 1,500 (1200 - 1800)

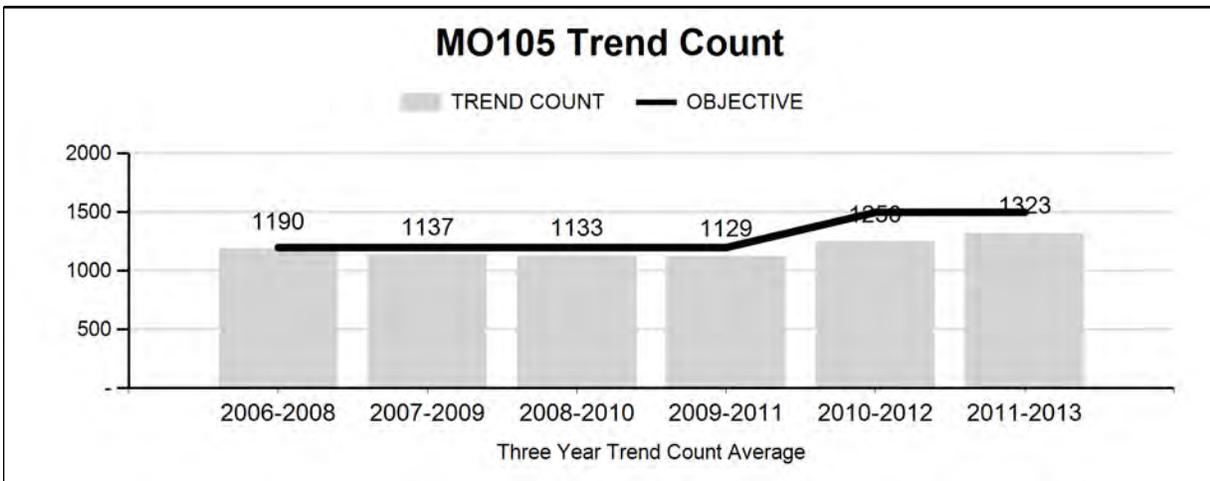
Management Strategy: Special

Percent population is above (+) or (-) objective: -6.7%

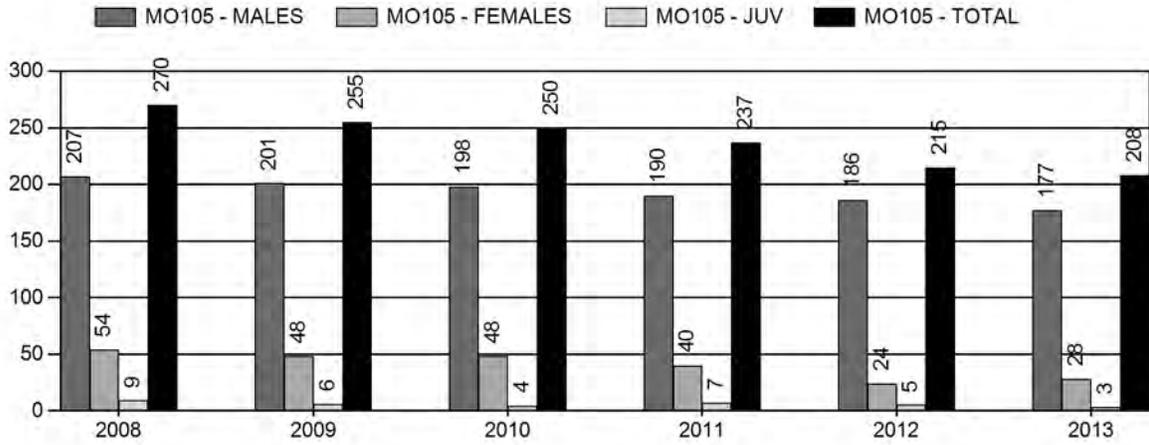
Number of years population has been + or - objective in recent trend: 0

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

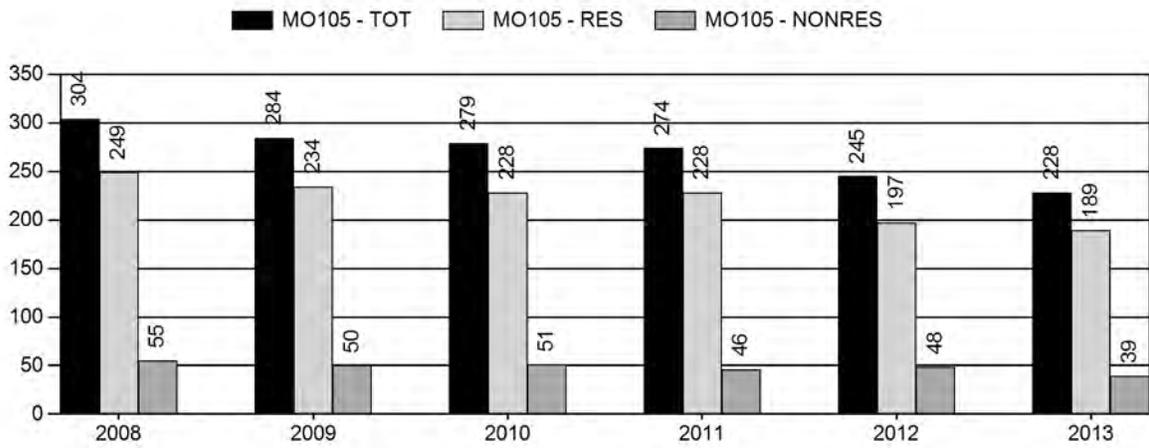
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



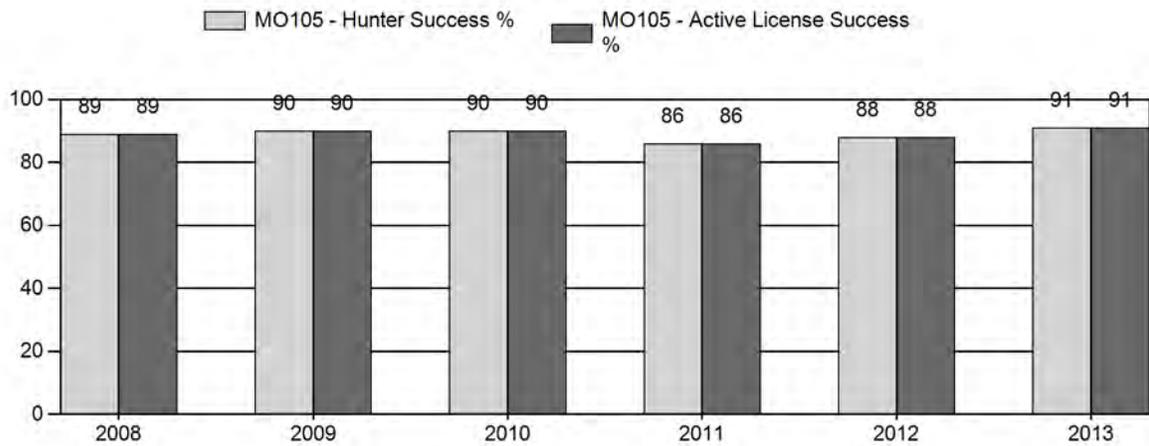
# Harvest



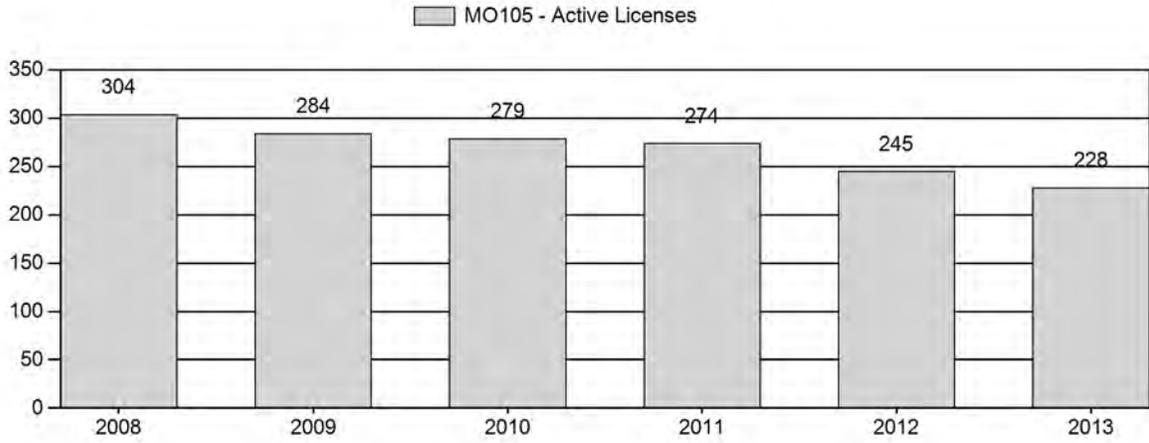
# Number of Hunters



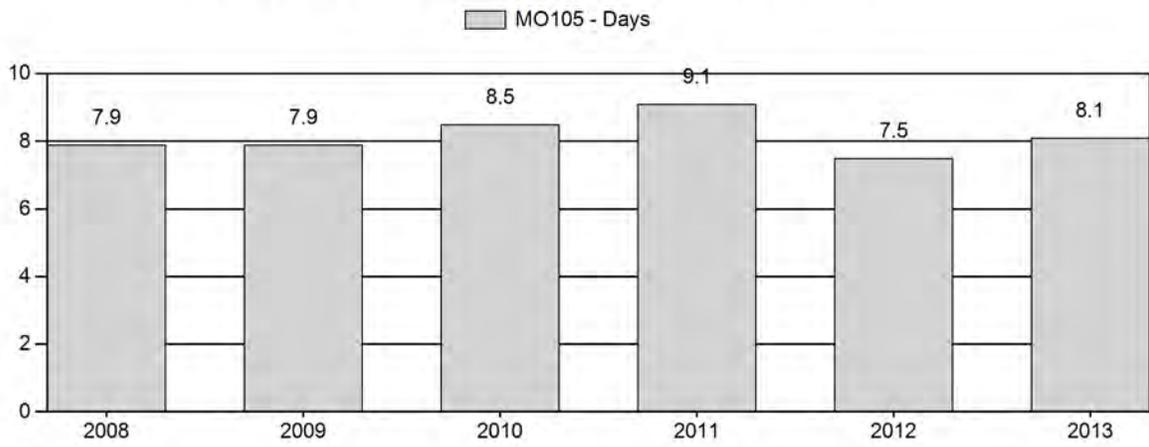
# Harvest Success



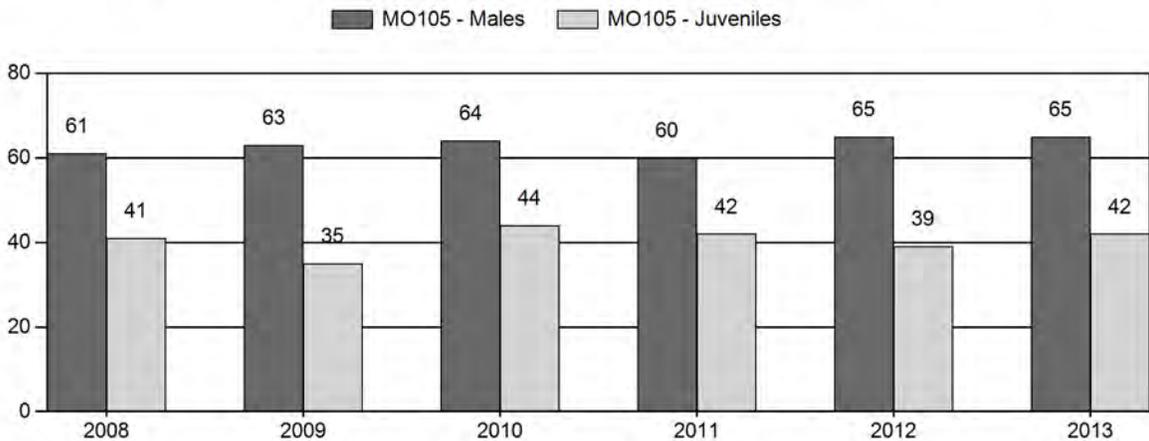
# Active Licenses



# Days per Animal Harvested



# Postseason Animals per 100 Females



**2008 - 2013 Postseason Classification Summary**

for Moose Herd MO105 - SUBLETTE

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylg	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	4,768	0	383	383	30%	629	50%	255	20%	1,267	980	0	61	61	± 4	41	± 3	25
2009	4,701	0	295	295	32%	465	50%	163	18%	923	1,041	0	63	63	± 0	35	± 0	21
2010	4,908	0	361	361	31%	563	48%	246	21%	1,170	1,111	0	64	64	± 0	44	± 0	27
2011	5,000	0	377	377	30%	625	49%	262	21%	1,264	1,016	0	60	60	± 4	42	± 3	26
2012	0	0	413	413	32%	632	49%	247	19%	1,292	1,118	0	65	65	± 0	39	± 0	24
2013	0	0	435	436	31%	669	48%	282	20%	1,387	909	0	65	65	± 0	42	± 0	26

**2014 Seasons – Sublette Moose Herd Unit (MO105)**

Hunt Area	Type	Opens	Closes	Quota	License	Limitations
3	1	Sept. 20	Oct. 31	10	Limited quota	Antlered moose
4	1	Sept. 20	Oct. 31	10	Limited quota	Antlered moose
	4	Sept. 20	Oct. 31	5	Limited quota	Antlerless moose, except cow moose with calf at side
5	1	Oct. 1	Oct. 31	30	Limited quota	Antlered moose
	4	Oct. 1	Oct. 31	15	Limited quota	Antlerless moose, except cow moose with calf at side
10	1	Sept. 15	Oct. 31	15	Limited quota	Antlered moose
20	1	Sept. 15	Oct. 31	15	Limited quota	Antlered moose
21	1	Sept. 15	Oct. 31	5	Limited quota	Antlered moose
22	1	Oct. 1	Oct. 31	15	Limited quota	Antlered moose
23	1	Sept. 15	Oct. 31	25	Limited quota	Antlered moose
24	1	Sept. 15	Oct. 31	25	Limited quota	Antlered moose
	4	Sept. 15	Oct. 31	5	Limited quota	Antlerless moose, except cow moose with calf at side
25	1	Oct. 1	Oct. 31	45	Limited quota	Antlered moose
	4	Oct. 1	Oct. 31	15	Limited quota	Antlerless moose, except cow moose with calf at side
<b>Archery Seasons</b>						
3,4		Sept. 1	Sept. 19		Limited quota	Refer to Section 3
5,22, ,25		Sept. 1	Sept. 30		Limited quota	Refer to Section 3
10,20,21, 23, 24		Sept. 1	Sept. 14		Limited quota	Refer to Section 3

**Summary of Changes in License Numbers**

Hunt Area	License Type	Quota Changes from 2013
20	1	-5
<b>MO105 Totals</b>	<b>1</b>	<b>-5</b>

**Management Evaluation**

**Current Mid-Winter Trend Count Management Objective: 1,500**

**Management Strategy: Special**

**2013 Trend Count: 1,400**

## **Most Recent 3-year Running Average Trend Count: 1,323**

The Sublette Moose Herd Unit encompasses approximately 3,306 square miles of occupied moose habitat that lies within portions of Lincoln, Sublette, and Teton Counties. The Wyoming Range and Salt River Range Mountains, along with a portion of the Wind River and Gros Ventre Mountains lie within this herd unit. A total of 10 Hunt Areas (Areas 3, 4, 5, 10, 20, 21, 22, 23, 24, & 25) make up the Sublette Herd Unit. A mid-winter trend objective of 1,500 ( $\pm 20\%$ ) moose is the management objective for this herd unit. This herd unit is also under a “special” management strategy to maintain an average harvest age of 4 for bulls as a measure to maintain “trophy” harvest opportunities.

## **Herd Unit Issues**

Undetermined moose deaths have been documented within this herd unit during the past years. The significance of these spring mortalities are currently unknown, and it appears other factors besides hunter harvest is slowing population growth. A study is currently being conducted within a portion of this herd unit to document moose demographics, body condition, and survival rates to help managers better understand issues and problems within this moose population. Preliminary findings from this study have indicated lower than expected adult female survival, fluctuating pregnancy rates, and decent calf survival rates. Factors such as habitat conditions, disease, predation, etc. may be attributing to limited population growth in this herd and hopefully this study will identify problems and issues associated with this moose population.

## **Weather**

Although winter snow accumulations appear to influence winter trend count data as observations of moose at lower elevations increase during winters with above average snow loads, little is known of other effects of weather on this moose herd. Recent weather trends have been drier and warmer, with sporadic periods of harsh winter conditions. More specific information can be accessed from the following websites:

<http://www.ncdc.noaa.gov/temp-and-precip/time-series/>

<http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html>

## **Habitat**

The main plant community associations in this herd unit are willow, sagebrush, aspen, conifer, and alpine communities from lower to higher elevations (6,500 to 12,500 feet). Moose in this herd unit can be found on both private and public land managed by the U.S. Forest Service and Bureau of Land Management (BLM) during summer and fall periods. During the winter months most moose migrate to lower elevation willow bottom or aspen dominated habitats, typically associated with private lands. Roughly 700 square miles of native winter range have been identified in this herd unit, which encompasses all types of land ownership (private, public, and state trust land).

Habitat assessments were conducted in 2009-2011 within portions of this moose herd unit. Specific information about this habitat assessment along with other ongoing habitat project information can be found at the following source: Please see the [2013 Annual Report Strategic Habitat Plan Accomplishments, Jackson and Pinedale Region sections](#) located at either the Jackson or Pinedale Game & Fish Regional Office for detailed summaries of habitat work within the Sublette Herd Unit.

## Research

A study was initiated during February of 2011 to evaluate demography, nutrition, and habitat use within a portion of the Sublette Moose Herd. Although this results of this study is not final, a summary report is provided in Appendix A.

## Field Data

The number of moose documented during 2013 postseason classification surveys increased compared to 2012, a similar trend since 2010. Snow conditions were below normal during the first half of the 2013-2014 winter, with heavy snow accumulations during February 2014. High concentrations of moose at lower elevations (Areas 4 and 25) and fewer moose at higher elevation habitats are typically observed during winter surveys (Table 1). Trend counts are influenced by winter snow depths, as an even higher proportion of moose concentrate at lower, usually willow bottom, habitats on heavy snow years, and vacate higher elevation forested habitats where moose observability is poor. Budgeted survey time limits the coverage of forested habitats, concentrating survey efforts to lower elevation habitats where moose congregate in more open terrain where observability is good. Overall, trend counts have slightly increased annually since 2010, even with lower than normal snow levels in 2011 and 2012, indicating that some population growth has occurred in this herd.

Postseason classification surveys for 2013 produced a bull:100 cow ratio of 65:100, similar to the previous 5-year average of 63:100. The 2013 calf: 100 cow ratio of 42:100 was slightly higher than the 5-year average of 40:100.

**Table 1. Trend counts by Hunt Area for the Sublette Moose Herd Unit, 2004-2013.**

<u>Hunt Area</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
3	17	29	24	19	11	56	18	38	21	24
4	193	247	248	244	271	212	261	320	319	346
5	119	93	75	76	106	48	100	44	82	79
10	10	18	52	11	7	13	10	8	4	0
20	29	61	13	39	19	10	16	28	13	32
21	4	4	12	10	22	4	30	23	18	11
22	18	11	6	17	28	30	23	27	49	47
23	51	75	60	50	28	60	46	26	52	55
24	0	0	0	0	0	0	0	0	0	0
<u>25</u>	<u>755</u>	<u>749</u>	<u>606</u>	<u>729</u>	<u>788</u>	<u>503</u>	<u>679</u>	<u>754</u>	<u>742</u>	<u>806</u>
<b>Total</b>	<b>1196</b>	<b>1287</b>	<b>1096</b>	<b>1195</b>	<b>1280</b>	<b>936</b>	<b>1183</b>	<b>1268</b>	<b>1300</b>	<b>1400</b>

## Harvest Data

A total harvest of approximately 210 moose (180 bulls and 30 cows/calves) was reported in 2013, slightly lower than the 2012 harvest. Harvest has continued to decline slightly during the years, as managers have continued to make slight reduction in licenses. The total number of licenses issued declined from 630 in 2002 to 240 in 2013, a total decrease of 390 (62%). These reductions in license types since 2002 equates to declines of 83% (n=190) in antlerless and 50% (n=200) in antlered moose licenses. Compared to the previous 5-year averages, hunter success was slightly higher at 91% in 2013, while hunter effort remained similar at 8.1 days per animal harvested.

A total of 121 teeth representing approximately 58% of the reported 2013 harvest were aged using cementum annuli analysis. The 2013 tooth age results from the WGFD lab showed an average age of 3.9 (derived from 59% of reported harvest) for bulls and 3.7 (derived from 57% of reported

harvest) for cows. Average age of harvest remained similar for bulls and increased for cows compared to the 2011 (Figure 1). The 10-year average (2003-2012) age of harvest for this herd unit is approximately 4.0 years for both bulls and cows (Figure 1).

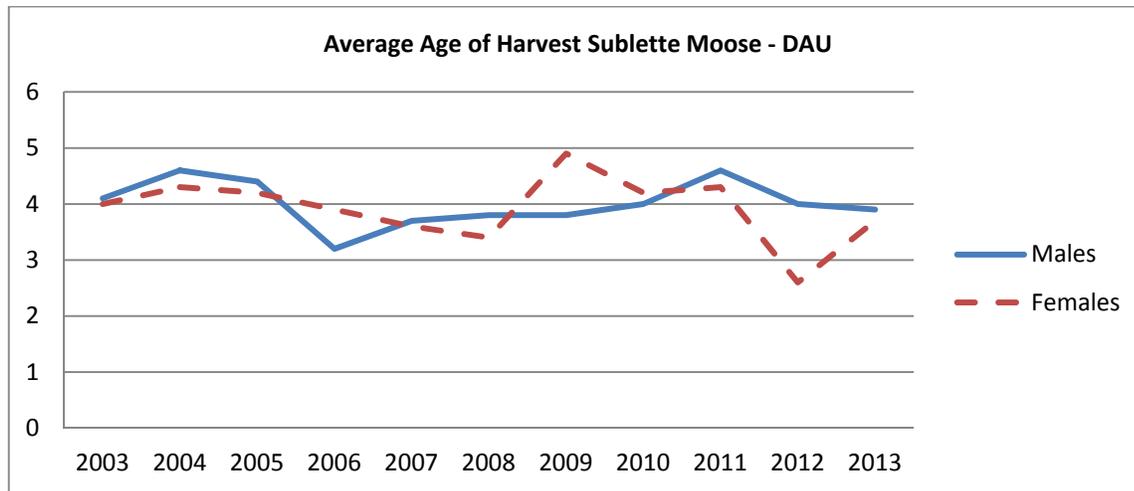


Figure 1. Average age of harvested male and female moose, Sublette Herd Unit, 2003-2013.

### Population

Starting in 2013, a mid-winter trend count was approved as the management objective for this herd unit instead of past population modeling efforts. The mid-winter trend objective for this herd is 1,500 moose ( $\pm 20\%$ ), which is higher than the past 10-year average around 1,200 moose. The 2013 mid-winter trend count was 1400 moose and the 3-year average (2011-2013) trend average was 1323 moose.

Past population modeling efforts for this herd have typically produced estimates higher, usually ~75% higher, than what annual trend counts document. Maintaining comparable classification survey efforts (flight time) compared to past years will provide managers a reliable data set that will reflect population trends in this herd unit. These mid-winter trend counts do not reflect the actual moose population, as not all areas with wintering moose are surveyed and not all moose are observed in those areas that are surveyed.

### Management Summary

Data for this herd unit suggest this postseason moose population was declining in the late 1990's, stabilized in 2004 and 2005, then began slowly increasing through 2013. During 2013, reproduction rates remain good at 42 calves:100 cows, male ratios remained relatively stable at 65 bulls:100cows, trend counts increased, and harvest success remained high at 91%. In addition, average age of harvested males is adequate and maintaining good bull quality throughout the herd unit. Trend data suggest the population is slowly increasing and hunter satisfaction appears to be good.

One license change, reduction of Type 1 licenses (-5) in Area 20, was made for the 2014 season. A total of 195 Type 1 (antlered) and 40 Type 4 (antlerless) licenses are available for 2014. Opening dates were changed to September 15 in Areas 10, 20, 21, and 24. Harvest for 2014 is estimated at 175 bulls and 30 cows/calves for a total harvest of 205 moose. Given average reproduction and survival, this harvest should result in a 2014 mid-winter trend count near 1,400 – 1,450 moose.

## Appendix A

### Demography, nutrition, and habitat use of the Sublette moose herd

Brendan Oates<sup>1,2</sup>, Gary Fralick<sup>3</sup>, Jacob R. Goheen<sup>1</sup>, Matthew J. Kauffman<sup>1,2</sup>, Kevin L. Monteith<sup>2</sup>, Scott Smith<sup>3</sup>

<sup>1</sup>University of Wyoming, Department of Zoology and Physiology

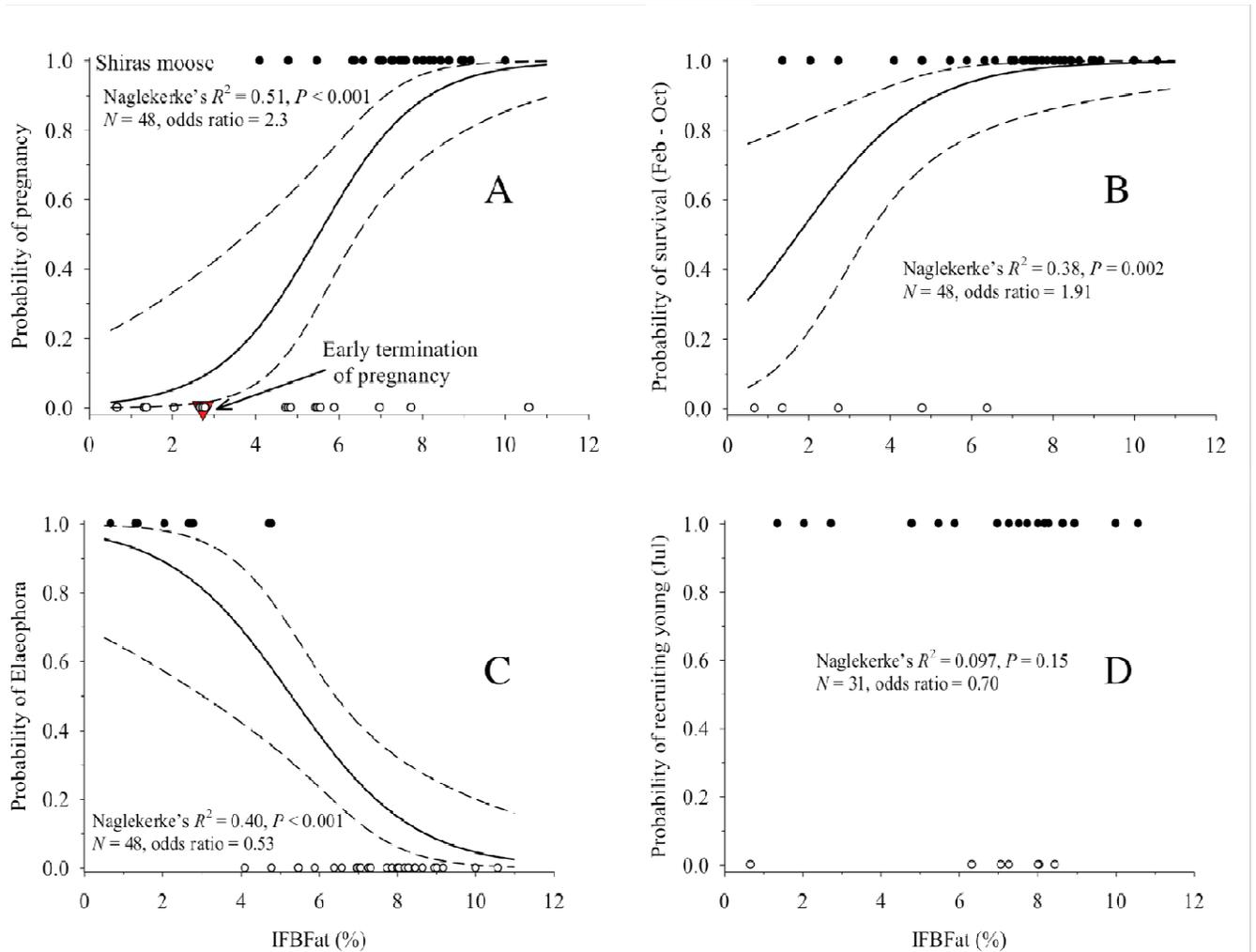
<sup>2</sup>Wyoming Cooperative Fish and Wildlife Research Unit

<sup>3</sup>Wyoming Game and Fish Department

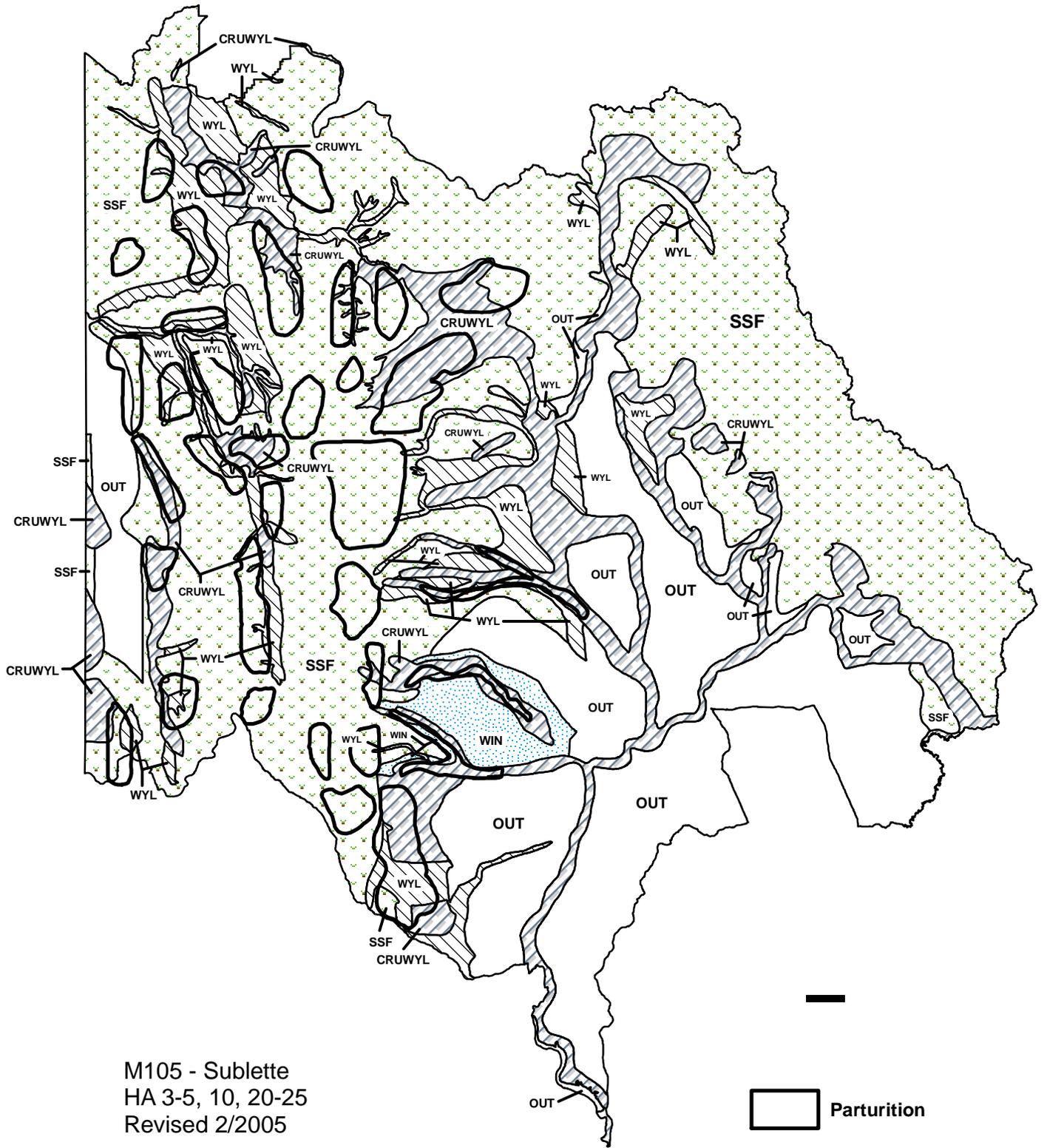
The Sublette moose herd represents the largest and most economically-important moose population in Wyoming. In 2010, we initiated our study at the behest of the Wyoming Governor's office to provide information on 1) the survival and fecundity of cow moose; 2) rates of juvenile recruitment; and 3) habitat selection and migration between winter and summer ranges. The impetus for this initiative was to provide baseline information prior to potential energy development by Plains Exploration and Production Company (PXP) in the Hoback Basin. In Fall 2012, a collaboration of sportsmen and sportswomen, conservationists, outdoor enthusiasts, and Wyoming government officials organized to offer a buyout of the leases owned by PXP in the Hoback Basin. The Trust For Public Land agreed to broker the \$8.75 million deal with PXP, which was met in December. While the potential for energy development in the Hoback Basin has subsided, there are still natural gas leases (44,720 acres; i.e., the 44-7 leasing zone) that fall within our study area near the creeks of South Beaver, North Horse, and Cottonwood. Although moose are relatively abundant in the 44-7 leasing zone, very little is known about their demography or habitat use. Thus, it is crucial to continue our study where existing leases still are active. Further, our data provide information on the interacting influences of nutritional condition, disease, and predation for this important moose herd, which are critical but poorly-understood components of demography.

February 13<sup>th</sup> through the 15<sup>th</sup> 2012, 48 adult females were captured by Native Range Capture Services using net guns. 18 of these animals were recaptured from 2011, as well as 30 additional individuals. We used the occurrence of pregnancy-specific protein B, assessed from blood samples, to estimate pregnancy rates of captured females (n=48). Pregnancy rates (2011: 46% n=23; 2012: 69% n=48) were low for moose. Using ultrasonography, each female (n=48) was measured for percent body fat, which is the most reliable index of nutritional condition. These measurements were then related the probability of survival, pregnancy, and presence of *Elaeophora schneideri*, which were all strongly correlated to nutritional condition (see Figure 1 on page 2).

Pregnant females are located biannually via helicopter (once in June and then again in July) to assess parturition and neonate survival. Neonate survival was 64% ± 0.13 SE (n=11) in 2011 and 81% ± 0.07 SE (n=32) in 2012, both of which are relatively high rates compared to other moose populations in North America. Currently, we are collecting movement data of collared moose as they die (collar retrieved from field) or once collar-release mechanism activates on April 1, 2014. To date, we have collected 14 GPS collars and downloaded their movement data. Analysis of movement and habitat use will begin in Spring 2013.



**Figure 1.** The estimated effect ( $\pm 95\%$  CI) of ingesta-free body fat (IFBFat) on probability of pregnancy (A), survival (B), *Elaeophora schneideri* (C; based on known physical symptoms) for adult (>2 yr. old) female Shiras moose in February 2012 from Sublette County, Wyoming. Percent IFBFat was strongly related to pregnancy, survival, and evidence of *Elaeophora*, but not neonate survival (D). Black circles indicate presence (or a positive demographic outcome) and open circles represent absence (or a negative demographic outcome).



M105 - Sublette  
 HA 3-5, 10, 20-25  
 Revised 2/2005