

**BIGHORN MOOSE
(MS 313)
Hunt Area 1, 34, 42, 43
2007 Season Recommendations**

HUNT AREA	TYPE	DATE OF SEASONS		LIMITATIONS
		OPENS	CLOSES	
1	1	Oct. 1	Oct. 14	Limited quota; 20 licenses any moose except cow moose with calf at side
	2	Oct. 1	Oct. 14	Limited quota; 20 license antlerless moose except cow moose with calf at side
34	1	Oct. 1	Oct. 14	Limited quota; 15 licenses any moose except cow moose with calf at side
	2	Oct. 1	Oct. 14	Limited quota; 20 licenses antlerless moose except cow moose with calf at side
42	1	Oct. 1	Oct. 14	Limited quota; 5 licenses any moose except cow moose with calf at side
43	1	Oct. 1	Oct. 14	Limited quota; 5 licenses any moose except cow moose with calf at side
ARCHERY 1, 34, 42, 43		Sept. 15	Sept. 30	Refer to Section 4 of this Chapter

We recommend the following changes for 2007: reduce Area 1, Type 1 licenses by 5 licenses; reduce Area 34, Type 1 license by 5 licenses.

MANAGEMENT EVALUATION

Current Post-season Objective: 500

2006 Post-season Population Estimate: ~ 480 (at objective)

2007 Post-season Population Estimate: ~ 460

Current Population Trend: Management during the early 1990s was designed to reduce this moose population to address willow utilization concerns. Sustained female harvest and reduced production through the early and mid-1990's in Hunt Area 1 reduced this segment of the population. This was most noticeable in easily accessible areas. During the late 1990s, harvest was reduced to address concerns of lowering populations. Since then, we have again increased harvest, especially in Area 34 after surveys indicated the number of moose in this hunt area was considerably above desired levels. We believe the population is at or below the objective at this time. We have developed a Pop-II population simulation model. This model appears to reasonably simulate the population dynamics of this herd although several assumptions of population modeling are not met.

Proposed 2007 Harvest: The estimated harvest for 2007 includes 38 bulls and 35 cows and calves for a total estimated harvest of 73 moose. We propose to reduce antlered moose harvest in Areas 1 during 2007. Cows with calves at side will continue to be protected from harvest. This has been a popular regulation and appears to protect reproductively successful females, reduces calf mortalities due to being orphaned, and may reduce competition with prime age animals by removing older, non-productive females from the population.

Management Challenges: Some problems associated with the management of this herd include lack of sufficient funding for data collection, lack of a reliable population estimate technique, non-hunting mortality (e.g. illegal harvest, moose-vehicle collisions, etc.) and possible forage competition with elk and / or livestock. Moose have been reduced in historic, highly visible areas with easy access. Survey of “back country” moose has proven difficult and the resulting data are inconsistent, making analysis difficult at best.

This is a highly visible moose population and provides outstanding viewing opportunities. The perception, and reality, is that we have reduced this population in highly visible areas. The public wants to "see" more moose in easily accessible areas. We will have to address forage utilization / competition concerns expressed by the U.S. Forest Service as this population continues to expand its distribution in the Bighorn Mountains.

Moose numbers have been decreased in Hunt Area 1. We recommend reducing Type 1 licenses in order to maintain bull quality in this hunt area. Hunter effort increased in 2006, while the average age of bulls ≥ 1 years old decreased, suggesting hunters had a difficult time finding mature (5+ years old) bulls in this hunt area.

Moose have been above desired levels in Hunt Area 34. Harvest has increased over the past four seasons to bring this segment of the population down towards desired levels. The average and median age of bulls ≥ 1 years old decreased in 2006, suggesting high harvest the past several years is reducing the number of mature bulls available for harvest.

Moose have colonized the western portion of the Bighorn Mountains and the population has increased to the level of separating Areas 42 and 43 with licenses in each area. This will assure some harvest from each area. Moose numbers are unknown at this time on the west side of the Bighorn and closing these areas in the future may be necessary to protect bulls.

The Governor of Wyoming issues 5 complimentary moose licenses each year. Most, if not all, of these licenses have been used in this herd unit (Areas 1 and/or 34) the past several years. This needs to be considered when setting quotas for Type 1 licenses in these hunt areas to account for this additional harvest.

Figure 1. Observed preseason classification ratios for moose in Bighorn Herd Unit.

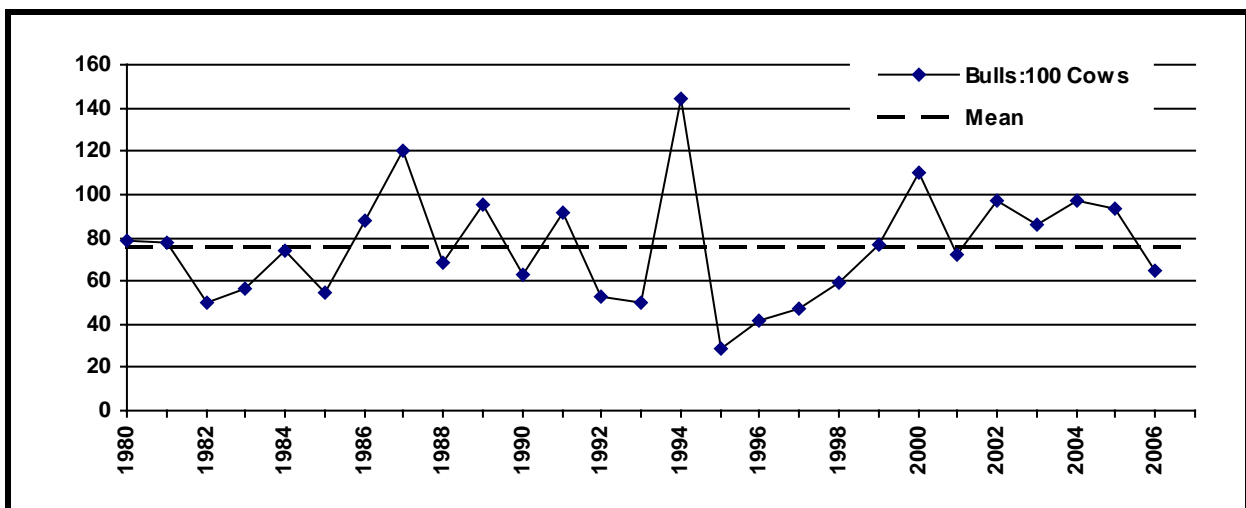


Figure 2. Observed preseason classification ratios for moose in Bighorn Herd Unit.

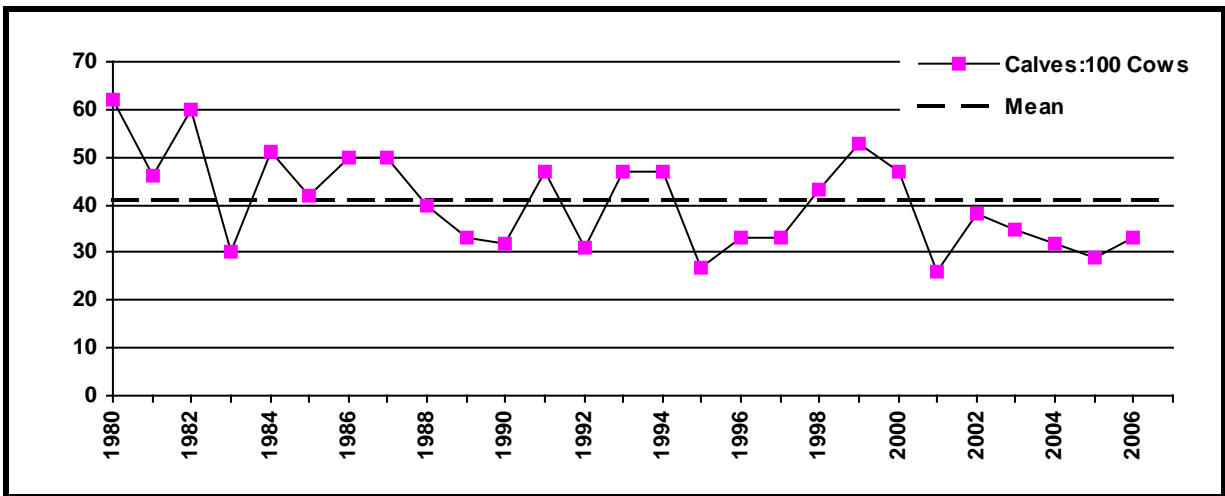


Figure 3. Annual moose harvest in Bighorn Herd Unit. Hunt areas 42 and 43 were hunted together as one area for the 2001, 2003 and 2004 seasons. All harvest during this time is listed under hunt area 42.

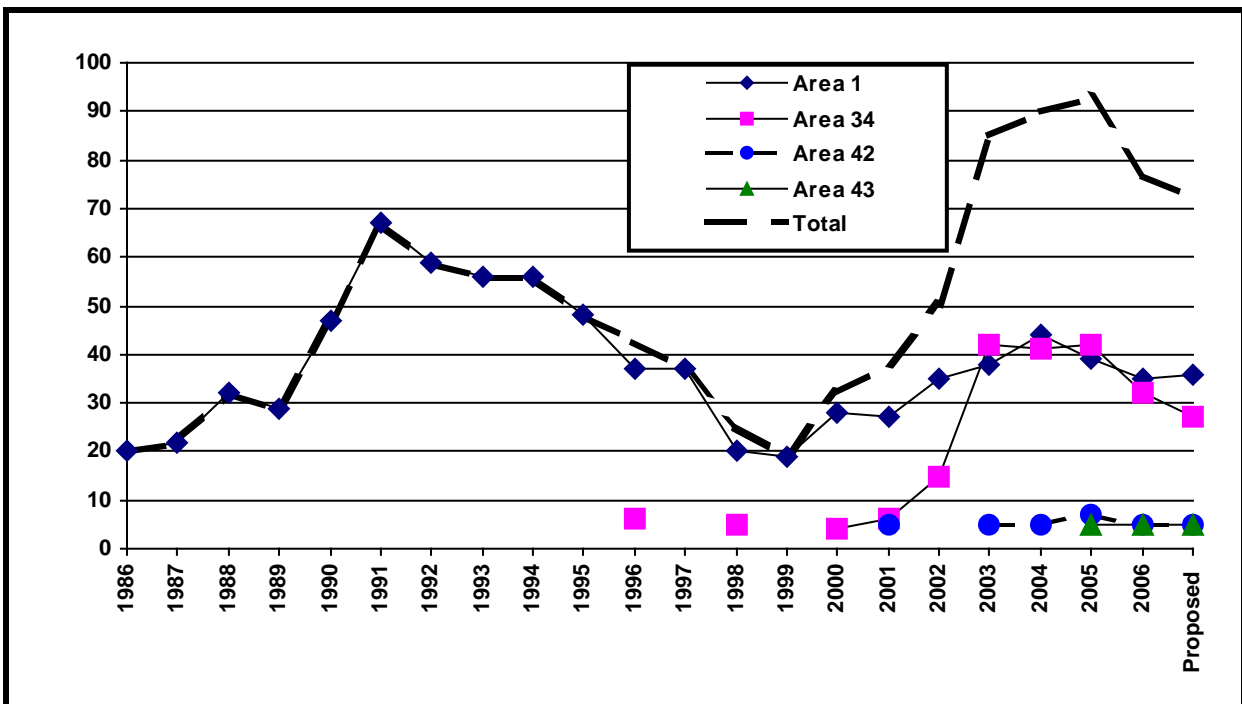


Table 1. Population Size During Bio-Year for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Start	Pre-Season	Post Season	End	%Growth
2002	900	772	714	635	-0.6
2003	895	753	660	593	-6.3
2004	838	694	597	540	-8.4
2005	768	621	510	463	-13.5
2006	664	564	479	433	-5.7
2007	626	545	459	412	-6.4

Table 2. Preseason Natural Mortality for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2002	121	3	4	128	14.2
2003	133	3	5	141	15.8
2004	136	4	5	145	17.3
2005	139	3	5	147	19.1
2006	95	2	3	100	15.1
2007	78	2	3	82	13.1

Table 3. Harvest Mortality for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2002	2	36	15	53	6.9
2003	3	47	35	85	11.3
2004	4	45	39	88	12.7
2005	3	50	48	101	16.3
2006	6	50	21	77	13.7
2007	5	38	35	78	14.3

Table 4. Harvest Percentages for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	Yearling Males
2002	1.5	13.1	4.2	6.87	19.6
2003	2.4	17.5	9.8	11.28	19.9
2004	3.7	18.1	11.6	12.69	19.6
2005	3.4	22.2	15.7	16.26	18.3
2006	5.7	26.0	7.9	13.66	17.7
2007	4.3	22.8	13.4	14.32	23.6

Table 5. Postseason Natural Mortality for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Sub-Adults	Adult Males	Adult Females	Total	% of Pop
2002	27	17	34	79	11.0
2003	25	14	29	67	10.2
2004	21	12	24	57	9.5
2005	17	10	20	47	9.2
2006	20	8	18	47	9.7
2007	22	8	17	46	10.1

Table 6. Preseason Ratios for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2002	38.1	61.2	15.0	76.2
2003	35.3	59.9	14.9	74.7
2004	32.4	59.4	14.5	73.9
2005	29.2	60.1	13.4	73.5
2006	40.0	59.6	12.8	72.4
2007	44.5	48.8	15.1	63.9

Table 7. Postseason Ratios for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Subadults /100 1+F	2+ Males /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2002	39.3	54.9	13.4	68.3
2003	38.5	54.1	13.4	67.6
2004	35.7	54.5	13.3	67.8
2005	34.0	54.8	12.3	67.1
2006	41.1	46.6	10.0	56.6
2007	49.8	42.9	13.3	56.2

Table 8. End of Year Ratios for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Subadults /100 Adlts	Subadults /100 1+F	Yr. Males /100 1+F	Ad Males /100 1+F
2002	20.5	34.9	14.5	70.3
2003	20.0	33.8	14.3	69.5
2004	18.3	31.1	14.0	69.4
2005	17.5	29.4	12.9	68.3
2006	22.6	35.5	10.5	57.5
2007	27.4	43.0	13.9	57.1

Table 9. Reproduction at Start of Bio-Year for BighornMoose 2007.GN1 05/10/2007 08:12 am

Bio-Year	Young / 100 AF 1 +	Sub-Ad. / 100 AF 1 +	Total Young	Total Sub- Adult	Total Females 1 +
2002	71	71	258	258	364
2003	71	71	260	260	363
2004	72	72	245	245	341
2005	73	73	228	228	311
2006	75	75	201	201	269
2007	73	73	194	194	264

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Data from 2002 to 2007

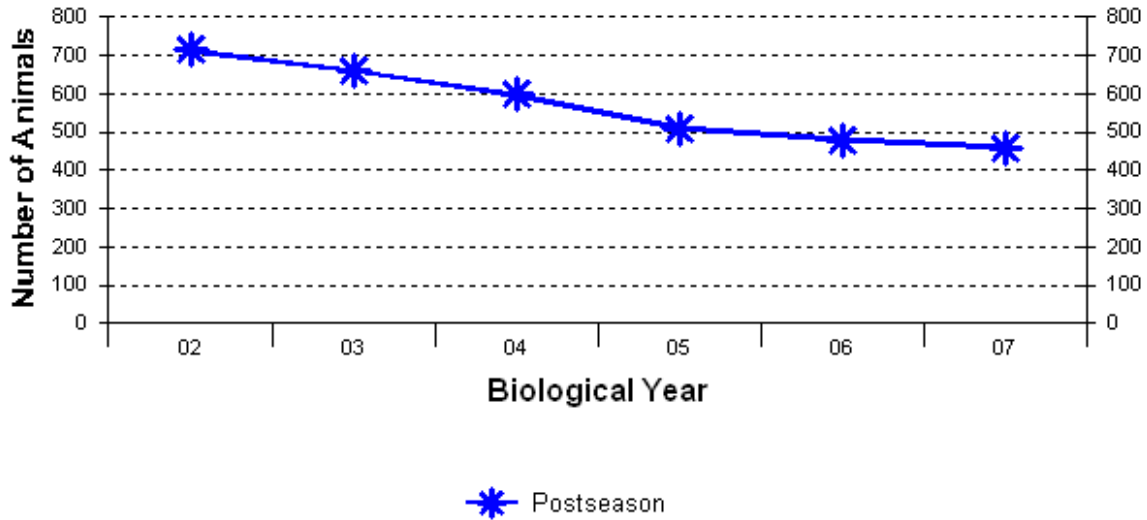
Simulation from 2002 to 2007

Age Class	Init Pop. Prop.		Presn Mort%		Postsn Mort%		Effort Set 1		Effort Set 2	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	52.0	52.0	40.0	40.0	20.0	20.0	0.50	0.50	1.00	1.00
1	22.0	22.0	1.0	1.0	3.0	3.0	1.00	1.00	1.00	1.00
2	18.0	18.0	1.0	1.0	3.0	3.0	1.00	1.00	1.00	1.00
3	16.0	18.0	1.0	1.0	3.0	3.0	1.00	1.00	1.00	1.00
4	13.0	15.0	1.0	1.0	3.0	3.0	1.00	1.00	1.00	1.00
5	10.0	12.0	1.0	1.0	3.0	3.0	1.00	1.00	1.00	1.00
6	8.0	10.0	1.0	1.0	5.0	3.0	1.00	1.00	1.00	1.00
7	6.0	8.0	1.0	1.0	8.0	5.0	1.00	1.00	1.00	1.00
8	5.0	8.0	1.0	1.0	10.0	10.0	1.00	1.00	1.00	1.00
9	4.0	8.0	1.0	1.0	15.0	15.0	1.00	1.00	1.00	1.00
10	3.0	7.0	1.0	1.0	20.0	20.0	1.00	1.00	1.00	1.00
11	2.0	6.0	1.0	1.0	25.0	25.0	1.00	1.00	1.00	1.00
12	1.0	5.0	1.0	1.0	35.0	30.0	1.00	1.00	1.00	1.00
13	1.0	4.0	1.0	1.0	45.0	40.0	1.00	1.00	1.00	1.00
14	1.0	3.0	1.0	1.0	55.0	50.0	1.00	1.00	1.00	1.00
15	1.0	2.0	1.0	1.0	65.0	60.0	1.00	1.00	1.00	1.00
16	1.0	1.0	1.0	1.0	80.0	70.0	1.00	1.00	1.00	1.00
17	0.0	0.0	1.0	1.0	90.0	80.0	1.00	1.00	1.00	1.00
18	0.0	0.0	1.0	1.0	100.0	100.0	1.00	1.00	1.00	1.00
Sum =		363.0	Estimated Sum = 900		Subadults: Ages 0 to 0					

Bio-Year	Preseason MSI	MSI Function is Linear			Postseason MSI	Effort & Wound Set Used
		Harvest Subadults#	Des. Pop Size in NA Males#	Des. Pop Size in NA Females#		
2002	1.17	2	36	15	1.00	1
2003	1.28	3	47	35	1.00	1
2004	1.39	4	45	39	1.00	1
2005	1.52	3	50	48	1.00	1
2006	1.18	6	50	21	1.00	1
2007	1.00	5	38	35	1.00	1
Set 1 Wounding Loss		10.0%	10.0%	10.0%	Yearling Male 10.0%	
Set 1 Wounding Loss		10.0%	10.0%	10.0%	Yearling Male 10.0%	

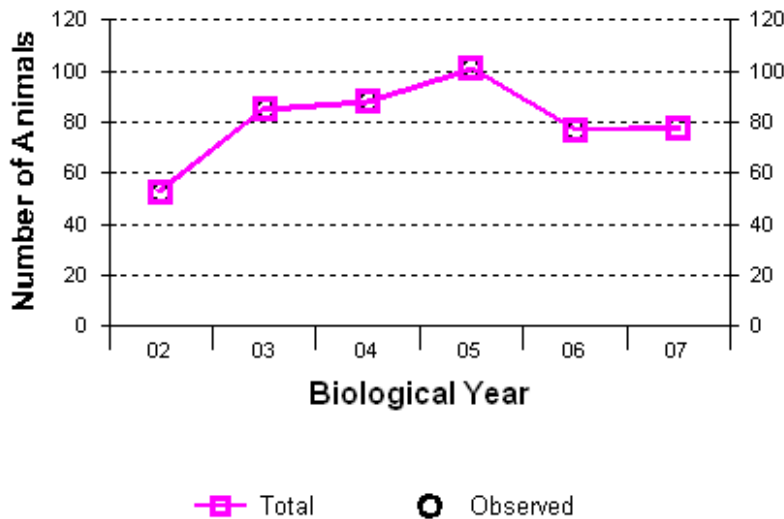
Bio-Year	Young/100 Fems		Young/100 Fems		Sex Ratio: 50 : 50
	Age 1 - 1	Age 2 - 2	Age 3 - 18	Age 3 - 18	
2003	0.0	0.0	0.0	100.0	
2004	0.0	0.0	0.0	100.0	
2005	0.0	0.0	0.0	100.0	
2006	0.0	0.0	0.0	100.0	
2007	0.0	0.0	0.0	100.0	
2008	0.0	0.0	0.0	100.0	

Graph 1. Population Size During Bio-Year



BighornMoose 2007.GN1, 05/10/2007 08:12 am

Graph 3. Harvest Mortality



YR	SIM	OBS
02	53	53
03	85	85
04	88	88
05	101	101
06	77	77
07	78	----

AVERAGES		
of Col.	80	
of Pair	81	81

BighornMoose 2007.GN1, 05/10/2007 08:12 am, Correlation (R) = 1, GOF = 1

