2014 - JCR Evaluation Form

SPECIES: Moose
PERIOD: 6/1/2014 - 5/31/2015

HERD: MO313 - BIGHORN

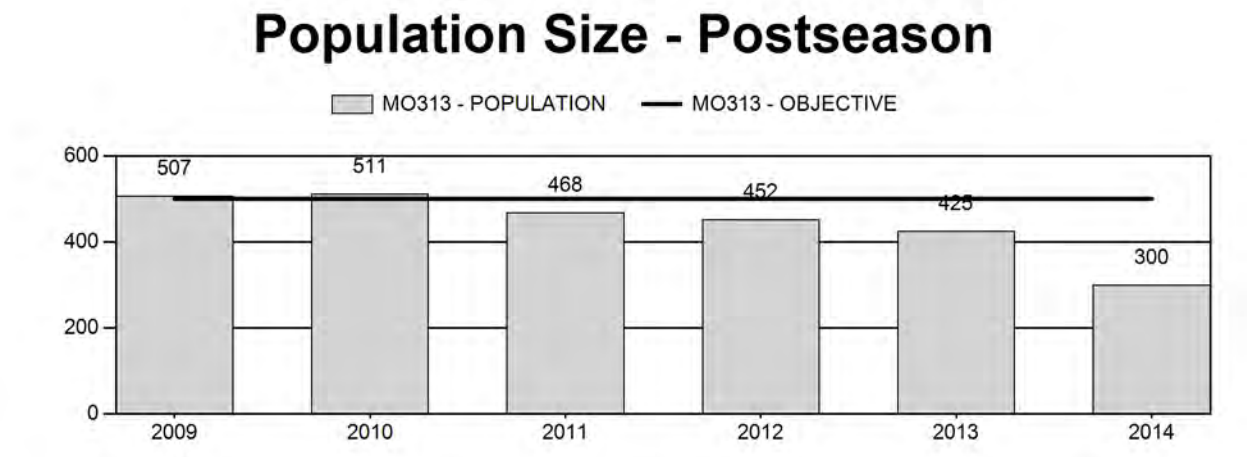
HUNT AREAS: 1, 34, 42
PREPARED BY: TIM THOMAS

	2009 - 2013 Average	2014	2015 Proposed
Population:	473	300	320
Harvest:	67	54	30
Hunters:	76	64	35
Hunter Success:	88%	84%	86%
Active Licenses:	76	64	35
Active License Success:	88%	84%	86%
Recreation Days:	483	604	275
Days Per Animal:	7.2	11.2	9.2
Males per 100 Females	93	43	
Juveniles per 100 Females	46	26	

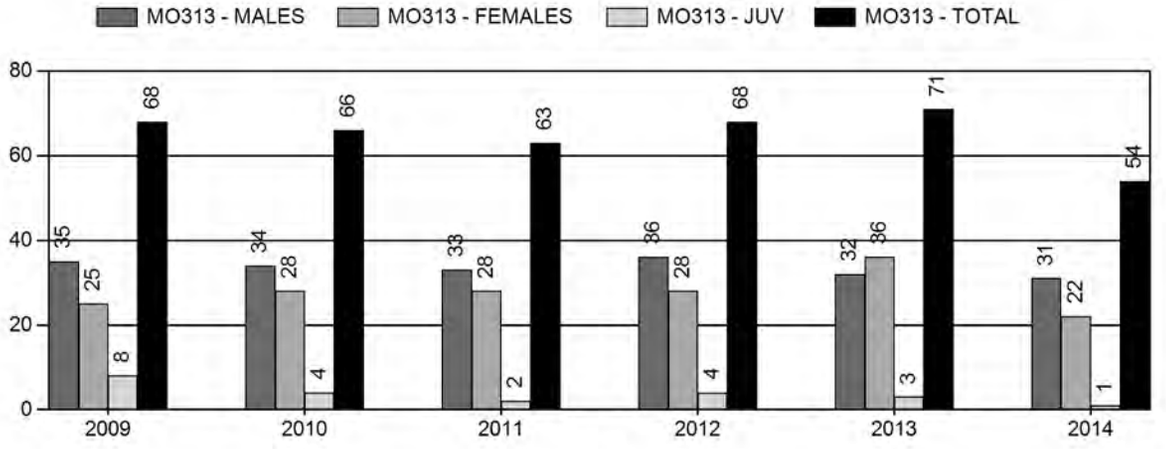
Population Objective (± 20%) :	500 (400 - 600)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-40%
Number of years population has been + or - objective in recent trend:	5
Model Date:	None

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

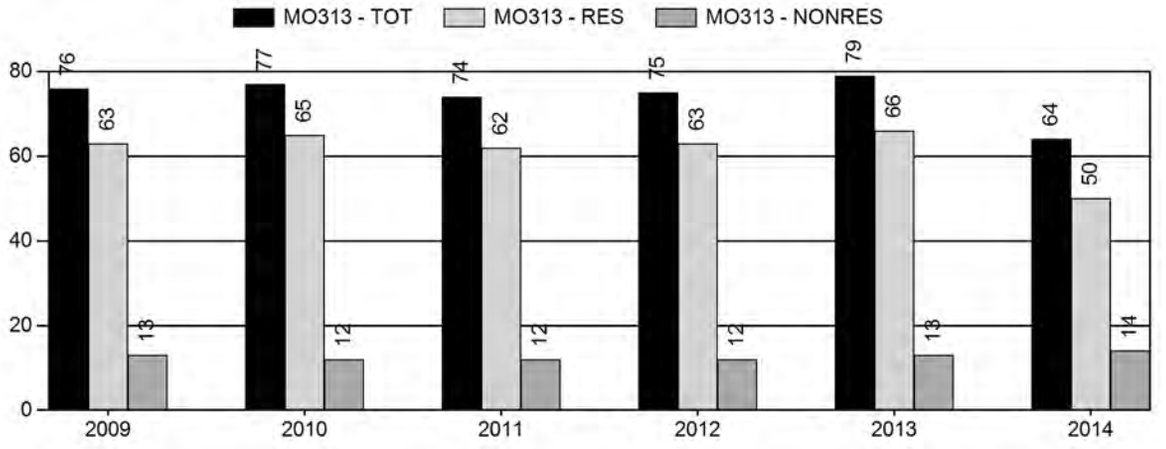
	JCR Year	Proposed
Females ≥ 1 year old:	13%	7%
Males ≥ 1 year old:	27%	18%
Juveniles (< 1 year old):	1%	0%
Total:	15%	8%
Proposed change in post-season population:	+1%	+3%



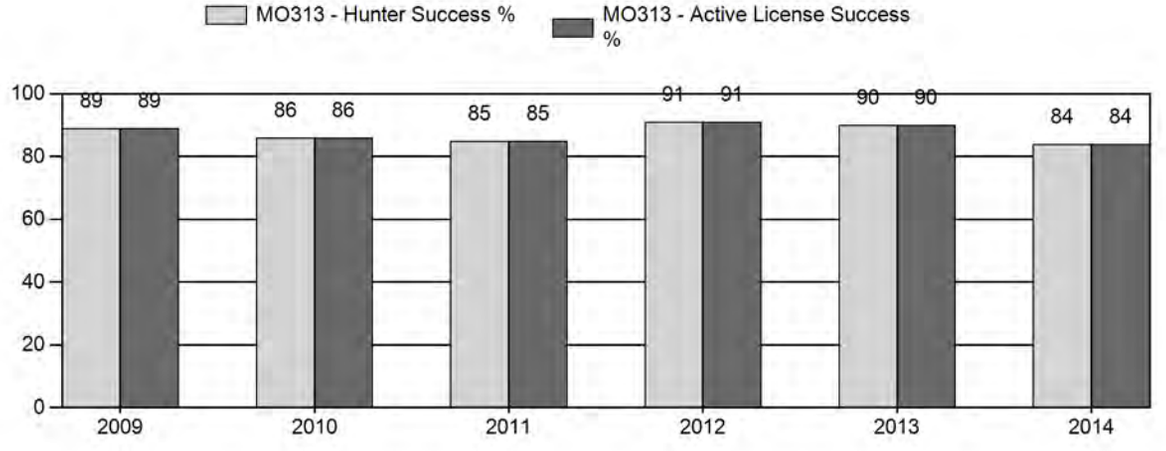
Harvest



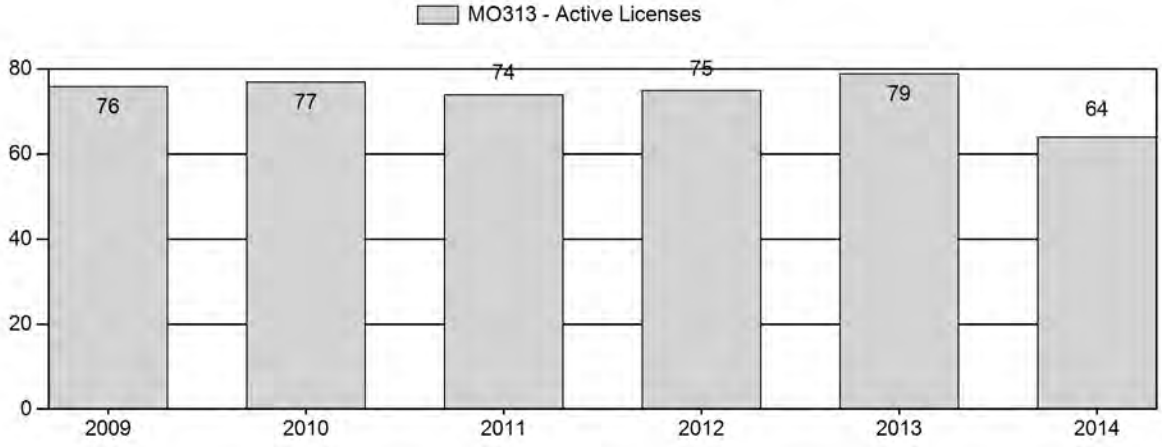
Number of Hunters



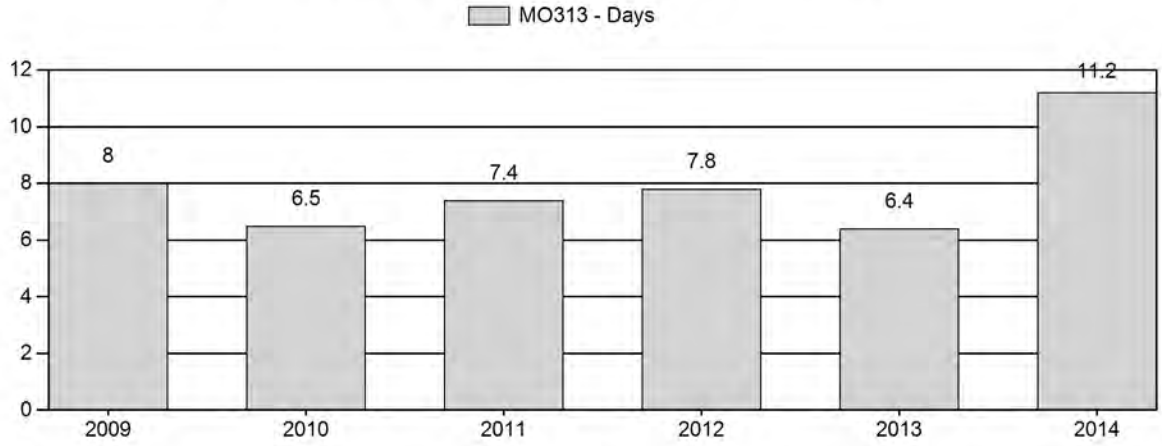
Harvest Success



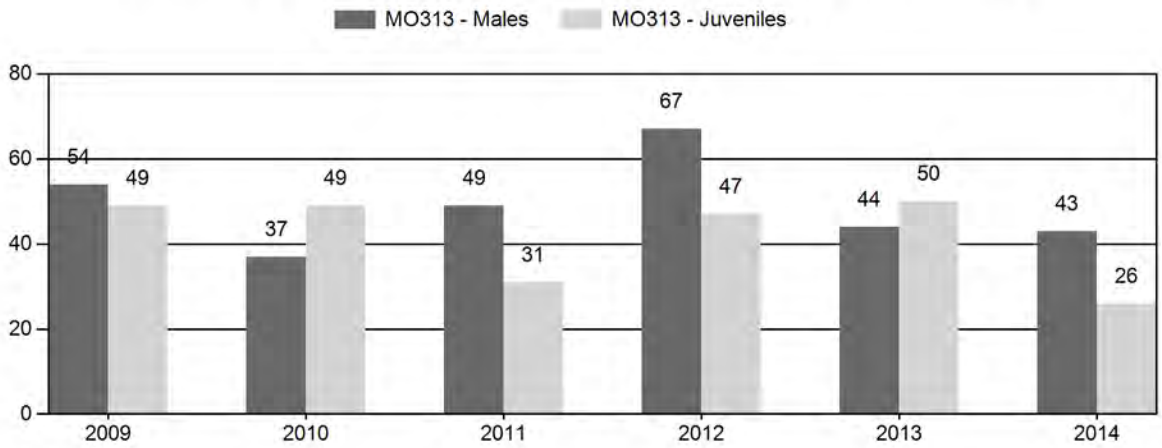
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Moose Herd MO313 - BIGHORN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	582	2	18	20	27%	37	49%	18	24%	75	382	5	49	54	± 0	49	± 0	32
2010	584	4	11	15	20%	41	54%	20	26%	76	353	10	27	37	± 0	49	± 0	36
2011	538	2	17	19	27%	39	56%	12	17%	70	331	5	44	49	± 0	31	± 0	21
2012	529	1	9	10	31%	15	47%	7	22%	32	396	7	60	67	± 0	47	± 0	28
2013	495	0	7	7	23%	16	52%	8	26%	31	326	0	44	44	± 0	50	± 0	35
2014	360	2	8	10	26%	23	59%	6	15%	39	239	9	35	43	± 0	26	± 0	18

2015 HUNTING SEASONS
BIGHORN MOOSE HERD (MO313)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	License	Limitations
1	1	Oct. 1	Oct. 31	10	Limited quota	Any moose, except cow moose with calf at side
	4	Oct. 1	Oct. 31	5	Limited quota	Antlerless moose, except cow moose with calf at side
34	1	Oct. 1	Oct. 31	5	Limited quota	Any moose, except cow moose with calf at side
	4	Oct. 1	Oct. 31	10	Limited quota	Antlerless moose, except cow moose with calf at side
42	1	Oct. 1	Oct. 31	5	Limited quota	Any moose, except cow moose with calf at side
Archery		Sep. 15	Sep. 30			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
1	1	- 5
1	4	- 5
34	1	- 5
34	4	- 10
Herd Unit Total	**1**	**- 10**
	4	**- 15**

Management Evaluation
Current Postseason Population Management Objective: 500
Management Strategy: Special
2014 Postseason Population Estimate: ~ 300
2015 Proposed Postseason Population Estimate: ~ 320

Herd Unit Issues

The management objective for the Bighorn Moose Herd Unit is a post-season population objective of 500 moose, with a desired distribution of approximately 350 in Hunt Area 1, 70 moose in Hunt Area 34, and 80 moose in Hunt Area 42. The management strategy for all moose herd units is special management, emphasizing trophy quality opportunities. The objective and management strategy for this herd unit were last revised in 1996 and are scheduled for review in 2015.

Weather

The spring and summer of 2014 was relatively warm and wet, resulting in good forage production throughout the growing season in the Bighorn Mountains. The winter of 2014-15 was highly variable. It started with a few significant snow falls in September and early October, then was relatively open until early November. There was significant snow and colder temperatures from November through January. Starting in early February, the weather pattern fluctuated between unseasonably warm temperature and cold, snowy periods. Moose should have entered the winter in good condition, allowing them to survive the winter fairly well.

Moose appear to be sensitive to warmer temperatures, showing signs of increased metabolic rates or heat stress at about 23˚F during winter months and 57˚F during summer months. Recent research conducted in Massachusetts suggest moose move to thermal cover to avoid heat stress. This can alter feeding and movement patterns. Long-term consequences or effects on fitness of warming climates are not currently well understood.

Habitat

We do not have an established habitat transect in this herd unit. Range personnel with the Bighorn National Forest have collected willow transect information at various locations on the Bighorn Mountains, the primary range for moose in this herd unit. In general, taller willow species seem to be decreasing and shorter willow species seem to be maintaining or increasing. We believe taller willow species tend to be more desired browse species for big game such as moose. Taller willows produce more biomass than smaller willows, generally increasing the amount of forage available. As such, there may be a decline in preferred forage over time, reducing the carrying capacity for moose. Some habitat is relatively linear, such as along drainages on the west side in Hunt Area 42, limiting moose distribution.

Field Data

Field personnel classify moose in Hunt Areas 1 and 34 annually. In recent years, these surveys were conducted using aerial survey techniques from a Bell 206B JetRanger III. Hunt Area 1 is generally surveyed in late August, and Hunt Area 34 is surveyed during late November – mid-January, depending on survey conditions, snow cover, and aircraft availability. Classification counts are collected occasionally in Area 42, usually incidental to other duties during July and August. Survey results can vary significantly between years, often without easily discernible rational, making interpretation of data difficult at best (Fig.1). Over time, trends in survey counts can be observed and may provide insight to general population dynamics.

During 2014, we classified only 39 moose in Area 1, up slightly from the past 2 years, but still well below the long-term (n=25 years) average of 67 moose. This is the third year in a row with a very low classification count. We observed only 11 moose in the Goose Creek drainage the past 3 years (n=3 in 2012; n=4 in 2013; n=4 in 2014). We observed 43 bulls per 100 cows, similar to the previous year. We only observed 6 calves during the survey, for a ratio of 26 calves per 100 cows, the lowest observed calf production in 10 years.

In Area 34, we classified 33 moose, similar to 2013. This is the second year in a row with low classification counts. We observed 150 bulls and 60 calves per 100 cows. Post-season calf to cow ratio may be skewed upward due to selective harvest of barren cows due to hunting

regulations (i.e. cow without calf at side). Low sample size for both areas makes it difficult to have confidence that these ratios accurately reflect the population dynamics of this herd. We do obtain a known minimum population from these surveys.

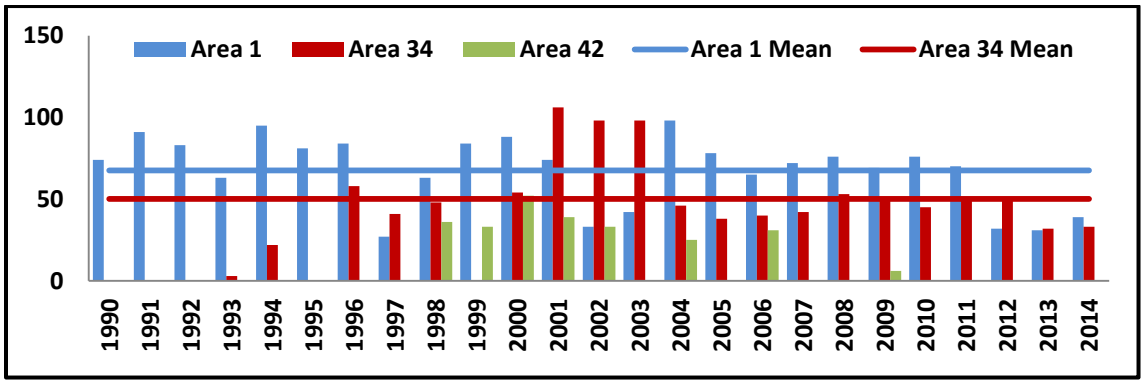


Figure 1. Moose classification/trend counts in Bighorn Herd Unit 1990 – 2014. Area 1 is surveyed in August of each year. Area 34 is surveyed in later November – January of each year. Area 42 is periodically surveyed during late summer incidental to other activities.

Teeth were collected from hunter harvested moose, generally through voluntary submission by successful hunters. Median age of males harvested in 2014 was 5 years old (mean = 4.8, n = 21, range = 2-11 yrs old), an increase from 2013 and above the minimum desired median age threshold (Fig. 2). Fifty seven percent of the harvested males were ≥ 5 years old, above the minimum desired level of 40% (Fig. 4), and the first increase in this index since 2009. Hunters seemed to be more selective in 2014, possibly accounting for an increase in average age of harvested moose. Also, access during most of October was good as weather conditions were relatively mild and open.

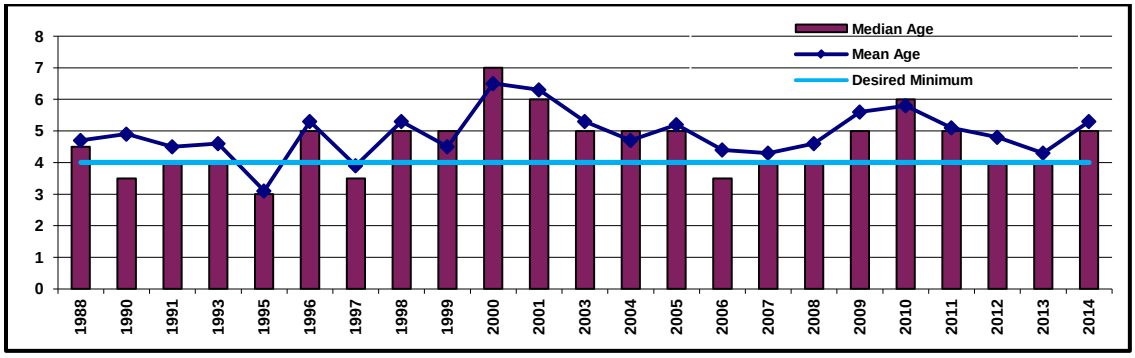


Figure 2. Median and mean age of harvested bull moose in Bighorn Herd Unit. Teeth aged by cementum analyses. Only male moose ≥ 1 year old included in analysis.

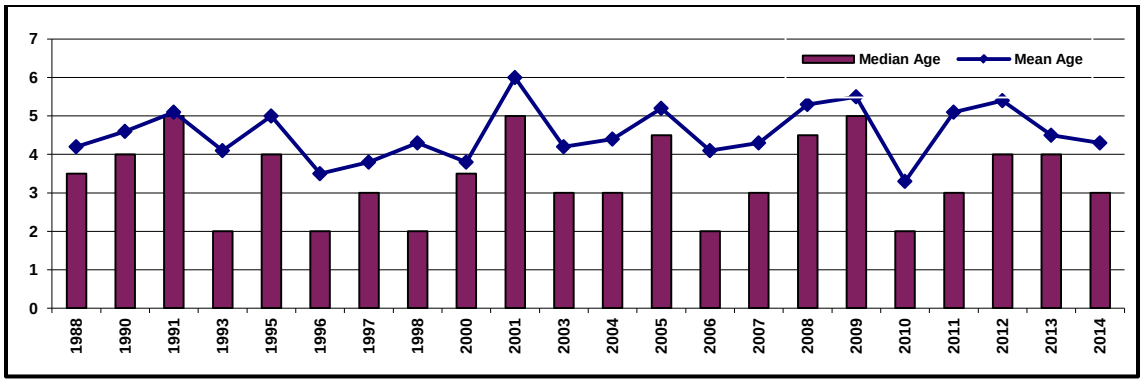


Figure 3. Median and mean age of harvested cow moose in Bighorn Herd Unit. Teeth aged by cementum analyses. Only female moose ≥ 1 year old included in analysis. There is no desired minimum threshold established for female moose age data.

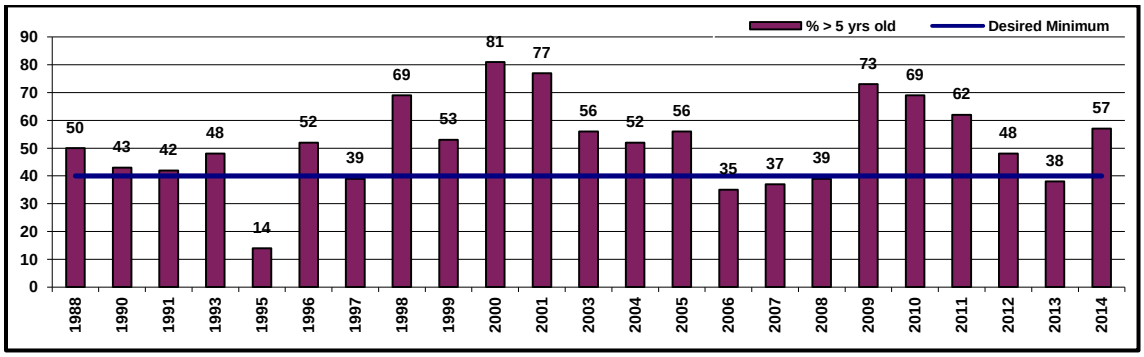


Figure 4. Percentage of harvested bull moose ≥ 5 years old by year. Teeth aged by cementum analyses. Only male moose ≥ 1 year old included in analysis.

Harvest Data

Hunters harvested an estimated 54 moose in 2014, a 24% decrease in harvest over 2013 and 19% decrease from the average harvest the past 5 years. Harvest declined as a result of a decrease in available licenses and relatively low success.

Hunter success was 84% and effort, as measured by days hunted per moose harvested, was 11.2 days/harvest. This was the lowest success rate since 1995 and the second lowest success rate ever for this herd unit. Hunter success was lowest in Area 34, with only 80% of Type 1 (any moose) license holders and 68% of Type 4 (antlerless moose) license holders successful. Effort almost doubled compared to 2013 (6.4 vs. 11.2 days/harvest) and was the second highest effort rate ever observed.

These parameters suggest moose were more difficult to find during the 2014 season. This could be a function of population declines as well as hunting conditions. We have likely reduced this population through harvest over the past decade. Moose along major roads, where they are readily visible and relatively easy to hunt, have been reduced the most. Also, in 2014, we had a significant snow fall on September 11. This colder weather caused willows to drop their leaves earlier than usual, resulting in moose moving into more timbered habitats where they were less visible and harder to hunt.

Since moose licenses are often a once-in-a-lifetime opportunity, especially in this herd unit, we try to maintain a sufficient population to assure high (i.e. 85%+) success rates for license holders.

Most hunters checked in the field seemed satisfied with their hunting experience in this herd unit. Comments submitted with the harvest survey were highly variable and suggested some hunters were satisfied while others were disappointed with their hunting experience.

Population

We have not developed a spreadsheet model for moose at this time. Population estimates for this herd unit are based on classification counts (Fig. 5), corrected for an estimated sightability bias. The correction factors are based on the observer's perceived idea of survey conditions and results, and have not been calibrated with independent sightability studies specific to this herd unit or habitat type. While the estimated correction factor has not been calibrated, we do obtain a known minimum population from classification surveys which can be viewed as a trend count.

We believe this moose population to be below the post-season objective at this time, at or near an estimated 300 moose (Fig. 5). We believe the population to be trending downward. Moose no longer occupy several areas along major forest service roads that were occupied 5-10 years ago.

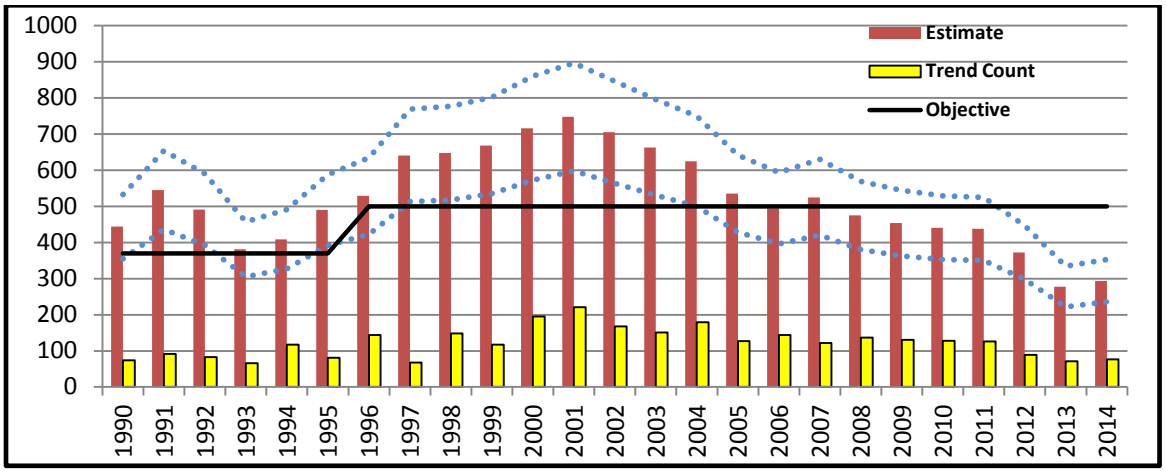


Figure 5. Estimated moose population using total classification survey results as a trend count. Correction factors varied from 15 – 30% sightability based on observers perception of quality of survey.

Management Summary

Moose licenses are limited quota in all hunt areas. The Bighorn Herd Unit is very popular based on the number of applications for licenses available. The regular hunting season runs October 1 – 31 in all hunt areas, with an archery pre-season from September 15 – 30. Archers often harvest up to 50% of the bulls harvested in any given year. Most moose hunting in this herd unit is on the Bighorn National Forest with good access for hunters. Snow can limit access into some areas as the season progresses.

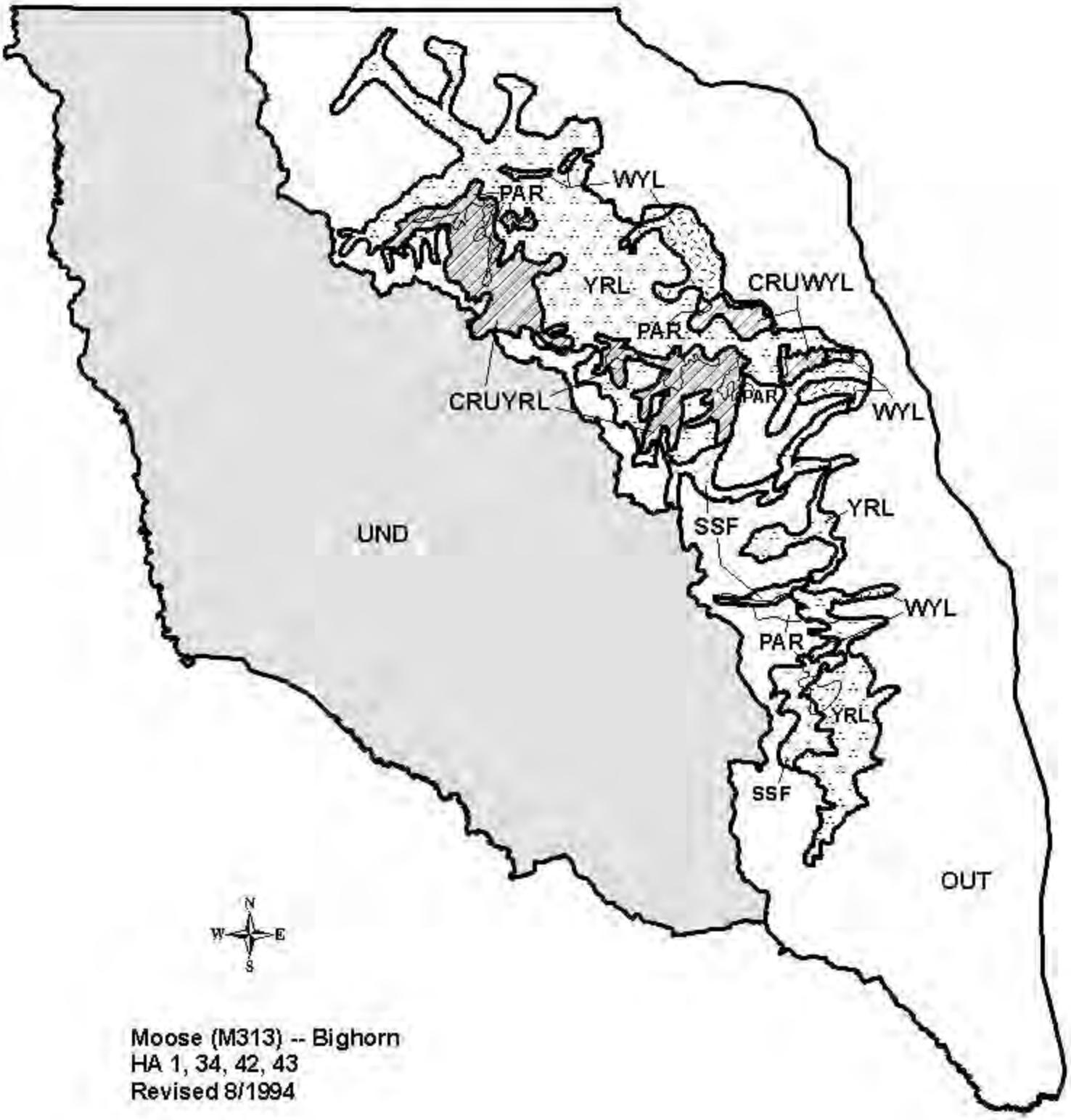
We are concerned that this population may be decreasing faster than desired and lower than desired. Moose no longer use some areas where they were common just 5-10 years ago. Reports of fewer moose, from both hunters and general wildlife viewers, have increased in recent years. Classification counts in 2014 were the 3rd year in a row with low counts. We are at or near

desired male harvest indices, suggesting we may be close to harvesting more males than is desired. This could result in a decrease in bull quality over time, contrary to the special management objective of providing trophy quality opportunities. This could also influence pregnancy rates if there are not sufficient males (60+ males:100 cows) to breed receptive females. As such, we reduced licenses in both Areas 1 and 34 this year.

We estimate a harvest of 30 moose in 2015, a decrease from recent years. This should keep the population near the current level. Wyoming Governor's Complimentary moose licenses are only valid in hunt areas with >10 any or antlered moose (i.e. Type 1) licenses. As such, they are no longer valid in any hunt area in this herd unit.

This herd unit provides quality wildlife viewing opportunities, with moose visible from U.S. Highways 14, 14A and 16, as well as main forest service roads, throughout the spring and summer.

Moose habitats, especially riparian and aspen communities, remain a concern on the Bighorn Mountains. We will continue to work with the Bighorn National Forest to address these concerns.



Moose (M313) -- Bighorn
HA 1, 34, 42, 43
Revised 8/1994

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