

## 2016 - JCR Evaluation Form

SPECIES: Moose

PERIOD: 6/1/2016 - 5/31/2017

HERD: MO415 - UINTA

HUNT AREAS: 27, 35, 44, 901-902

PREPARED BY: JEFF SHORT

	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	0	N/A	N/A
Harvest:	19	19	14
Hunters:	22	20	15
Hunter Success:	86%	95%	93%
Active Licenses:	22	20	15
Active License Success:	86%	95%	93%
Recreation Days:	177	180	140
Days Per Animal:	9.3	9.5	10
Males per 100 Females	40	25	
Juveniles per 100 Females	52	62	

Population Objective ( $\pm 20\%$ ) : NA (0 - 0)

Management Strategy: Special

Percent population is above (+) or below (-) objective: N/A

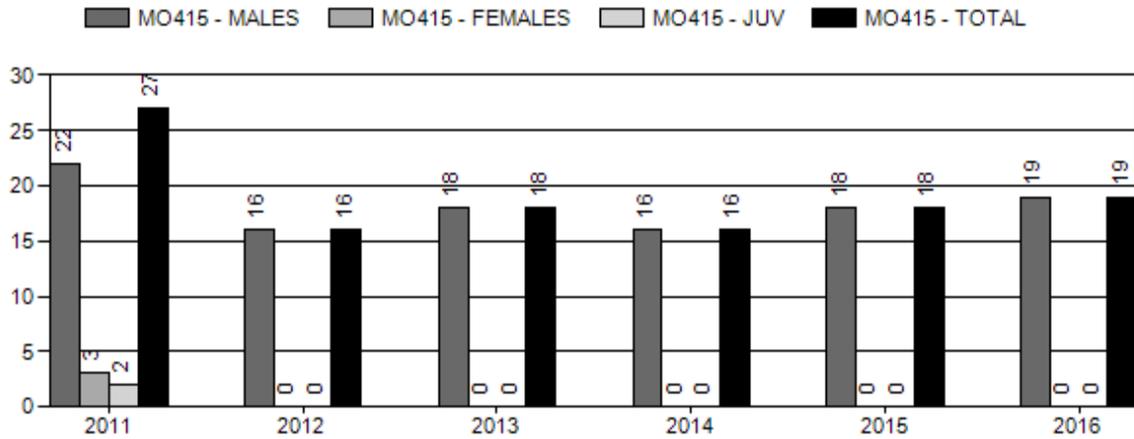
Number of years population has been + or - objective in recent trend: NA

Model Date: None

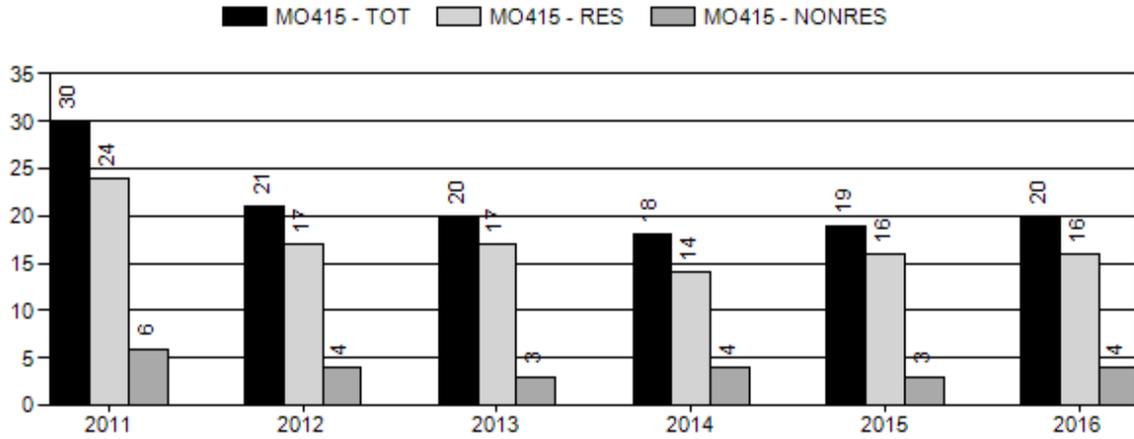
**Proposed harvest rates (percent of pre-season estimate for each sex/age group):**

	<u>JCR Year</u>	<u>Proposed</u>
Females $\geq$ 1 year old:	NA	NA
Males $\geq$ 1 year old:	NA	NA
Total:	NA	NA
Proposed change in post-season population:	NA	NA

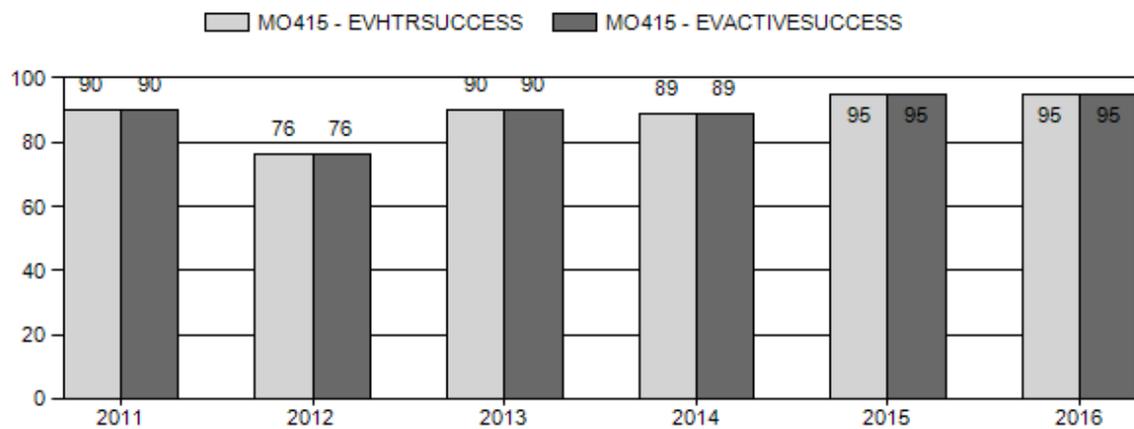
# Harvest



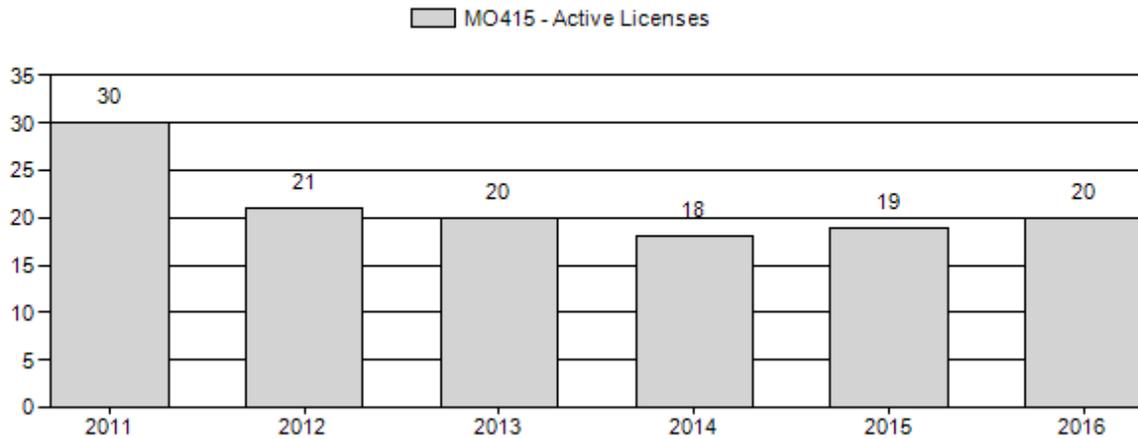
# Number of Active Licenses



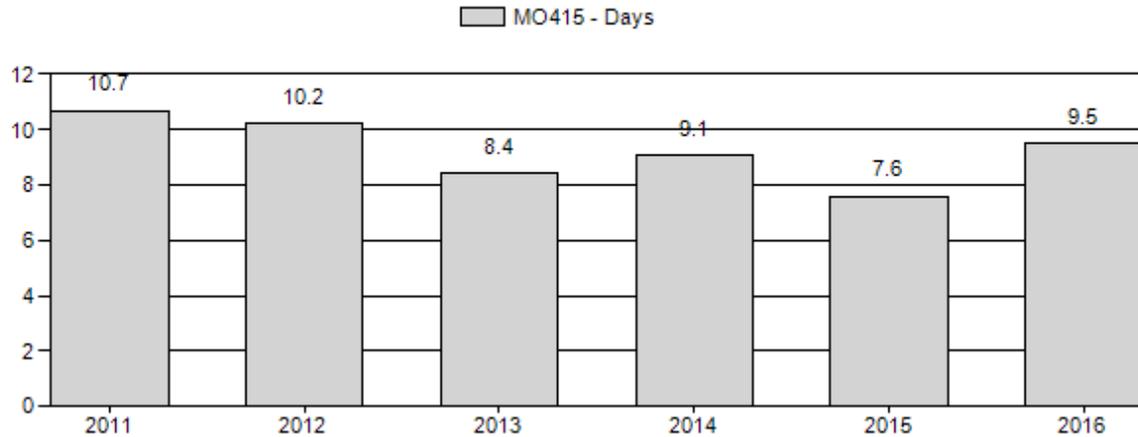
# Harvest Success



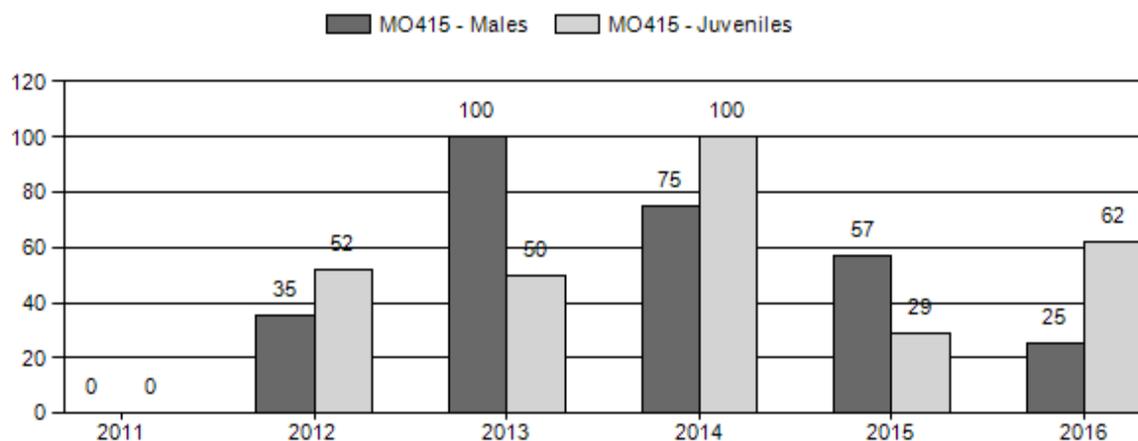
## Active Licenses



## Days per Animal Harvested



## Postseason Animals per 100 Females



**2011 - 2016 Postseason Classification Summary**

for Moose Herd MO415 - UINTA

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2012	0	0	52	52	19%	149	54%	77	28%	278	0	0	35	35	±0	52	±0	38
2013	0	0	8	8	40%	8	40%	4	20%	20	0	0	100	100	±0	50	±0	25
2014	0	1	2	3	27%	4	36%	4	36%	11	0	25	50	75	±0	100	±0	57
2015	0	1	3	4	31%	7	54%	2	15%	13	0	14	43	57	±0	29	±0	18
2016	0	0	2	2	13%	8	53%	5	33%	15	0	0	25	25	±0	62	±0	50

**2017 HUNTING SEASON**

SPECIES : **Moose**

HERD UNIT : **UINTA (415)**

HUNT AREAS: **27, 35, 44**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
27	1	Oct. 1	Nov. 20	12	Limited quota	Antlered moose
35	1	Oct. 1	Nov. 20	3	Limited quota	Antlered moose
44						CLOSED

27, 35 Archery Sept. 1 Sept. 30 Limited quota Refer to Section 2 of this chapter

Hunt Area	License Type	Quota change from 2016
27	1	-3
35	1	-2
Herd Unit Total	1	-5

**Management Evaluation**

**Current Postseason Population Management Objective:** Harvest Based

**Management Strategy:** Special

**2016 Postseason Population Estimate:** ~300

**2017 Proposed Postseason Population Estimate:** ~300

## **Herd Unit Issues**

This moose population is an interstate herd shared with Utah. Many moose in this unit that summer in the Uinta Mountains in Utah move into Wyoming to winter. Limited winter range continues to be an issue for this herd. A significant portion of the lower elevation moose habitat is on private land and landowner tolerance of moose can be an issue. Moose coming into towns and residing in yards has been a reoccurring issue in this population and numerous conflicts have occurred, resulting in necessary translocation of these animals. However, this issue is far less common than in the past, as moose populations have declined significantly.

The biggest issue facing this population is a lack of knowledge on disease impacts, primarily prevalence rates) in this herd. We have documented several cases of elaeophorosis and keratoconjunctivitis in this population and believe this may have had a significant population effects on the herd. While equally unknown, losses to these diseases appear to have stabilized, at least the number of reports have. However, we are continuing our conservative management strategy until we observe some increase in moose numbers.

In 2006, hunt area 44 was added to the herd unit. There have been fluctuating numbers of moose in this area, and contains limited moose habitat. When numbers are high it has created some concern to habitat managers since these moose are impacting the ability to reestablish riparian shrubs and rehabilitate aspen in these xeric habitats. The objective has been to limit the number of moose in this area. This area is sometimes hunted in combination with the adjacent area 35, sometime is hunted with its own season, or is closed, depending on moose abundance. Managers are reluctant to issue licenses in this area due to the fact moose license numbers have declined and are becoming increasingly hard to draw, and the fact harvest success in this area is very low. The ability of managers to issue fewer than 5 licenses in an area will solve this concern.

## **Weather**

Weather during 2016 and into 2017 has been highly variable, ranging from a very mild winter in 2015-16 to a severe one in 2016-2017. In the early part of 2016 the winter started out harsh with high snow loads but it warmed up in February and March to finish fairly mild. A moist spring and early summer followed. In July and August conditions dried up considerably and limited precipitation fell through mid-December 2016. Beginning in late December, 2016, winter conditions became severe, with extreme cold and high snowfall. Most moose in this herd migrated to crucial winter ranges.. The winters from 2011 until 2015 were fairly mild with low snowpack and relatively warm temperatures resulting in easy winter conditions, and moose often remained higher on transitional habitats.

Smaller moose calves likely succumbed to winter mortality this most recent winter. The Utah Division of Wildlife has a number of moose collared in this population. Moose mortality was relatively high this year, especially on calf moose. Causes of mortality are still being investigated, but some moose succumbed to winter losses associated with winter ticks.

## **Habitat**

Moose habitat in this herd has long been a concern, especially the quantity and quality of willow riparian habitat, and the condition of mixed mountain shrubs on transition and winter ranges. An increased effort to quantify conditions and concerns will begin next year, using locational data provided by the Utah Division of Wildlife. The lack of a local terrestrial habitat biologist in this region impacts our ability to conduct adequate habitat analyses.

## Field Data

Since data is very limited in this herd, few trends are apparent other than moose numbers have declined significantly. It is not possible to model this interstate herd, and past efforts have resulted in very poor results and no confidence in outputs. Classification data is not collected consistently, usually from the air every third year with UDOW. We have experienced a significant reduction in nuisance moose complaints and reduced field observations of moose in the period between 2007 and 2011, followed by a perceived leveling since. Moose licenses were dramatically reduced in response to perceived population losses.

Limited moose flight data support our concerns about a reduction in moose numbers in the Uinta Herd Unit. The 2011 survey was conducted in ideal circumstances with high snow loads making moose highly visible and concentrated on specific wintering areas. The survey was also more intensely flown than previous surveys. This indicates that it was a good reference count and that we would have not missed large numbers of animals that may have been seen in previous surveys. The 2011 count represents the lowest total moose seen in Wyoming since the counts have been conducted. This information supported the deep cuts we made in moose harvest over those years. For 2017 we are again conservative with harvest opportunity. Despite reduced licenses, we remain below the minimum age of harvest objective. Moose harvested in areas 27 and 35 are also not meeting the % of male harvest  $\geq 5$  years of age objective.

Moose surveys are flown in cooperation with Utah DOW, most recently in February 2013. Past results are shown below. Utah pays for a joint elk and moose survey on average every third year. Classification data is collected during those surveys with Utah. In the off years some moose classification data is collected during aerial mule deer surveys in December. That data is reported in the JCR report graphs and tables but sample sizes are inadequate and results should be viewed with some caution.

### TOTAL MOOSE COUNTED BY YEAR

	1996	1998	2001	2004	2007	2011	2013
UTAH DAGGETT (8B)	103	84	109	107	95	NA	74
UTAH SUMMIT (8A)	182	229	243	150	181	92	104
WYOMING	393	289	334	270	314	232	174
TOTAL WYOMING AND UTAH SUMMIT	575	518	577	420	495	324	278
TOTAL	678	602	686	527	590	324	352

## Harvest Data

Antlerless harvest opportunity has been eliminated in this herd unit. We have dramatically reduced the number of licenses in the last six years due to perceived declines in moose abundance. Despite this, and as is typical for this species, antlered moose hunters have had very good success rates in the last five years. Tooth age data indicates at current hunting levels we are able to recruit a few older animals into the population and have them available to hunters. However, most of those older harvested animals have come from Area 44, which will again be closed for 2017 due to low moose numbers.

## 2011 - 2016 Harvest Summary

for Moose Herd MO415 - UINTA

Year	HUNTERS					HARVEST								SUCCESS				
	Res Htrs	NRes Htrs	% NRes	Total Htrs	Act Lic	Ylg Male	Adult Male	Total Male	% Male	Fem	% Fem	Juv	% Juv	Tot Harv	Hntrs	Act Lic	Hntr Days	Days to Harv
2011	24	6	20%	30	30	0	22	22	81%	3	11%	2	7%	27	90%	90%	288	10.7
2012	17	4	19%	21	21	0	16	16	100%	0	0%	0	0%	16	76%	76%	163	10.2
2013	17	3	15%	20	20	0	18	18	100%	0	0%	0	0%	18	90%	90%	151	8.4
2014	14	4	22%	18	18	0	16	16	100%	0	0%	0	0%	16	89%	89%	146	9.1
2015	16	3	16%	19	19	0	18	18	100%	0	0%	0	0%	18	95%	95%	137	7.6
2016	16	4	20%	20	20	0	19	19	100%	0	0%	0	0%	19	95%	95%	180	9.5

### Population

Due to interstate nature of this herd no working model exists. Wyoming hunters typically have fewer moose available (especially during the early season) and moose distribution is primarily dictated by weather conditions. Weather severity is the determining factor in the number of moose that enter Wyoming from Utah during the winter. This and other factors make data collected inconsistent and unreliable.

### Management Summary

For 2017 hunting seasons we will remain conservative with hunter harvest. Hunt area 44 will be closed again for 2017 and no antlerless harvest will be allowed in the herd unit. This is an effort to allow maximum growth of the herd. However, hunting is not the limiting factor for this herd. The objective and management strategy were revised in 2014. During that objective review process we moved to a new objective type for this herd. Due to the issues associated with modeling and tracking this population we have switched to a harvest statistic based objective. This entails an age of harvest objective and an average days per harvest objective.

#### **New objective criteria (Harvest Based)**

- Minimum age of Harvest (median  $\geq$  4 years)
- Days per Harvest (average  $\leq$  10 days)

#### **Secondary objective:**

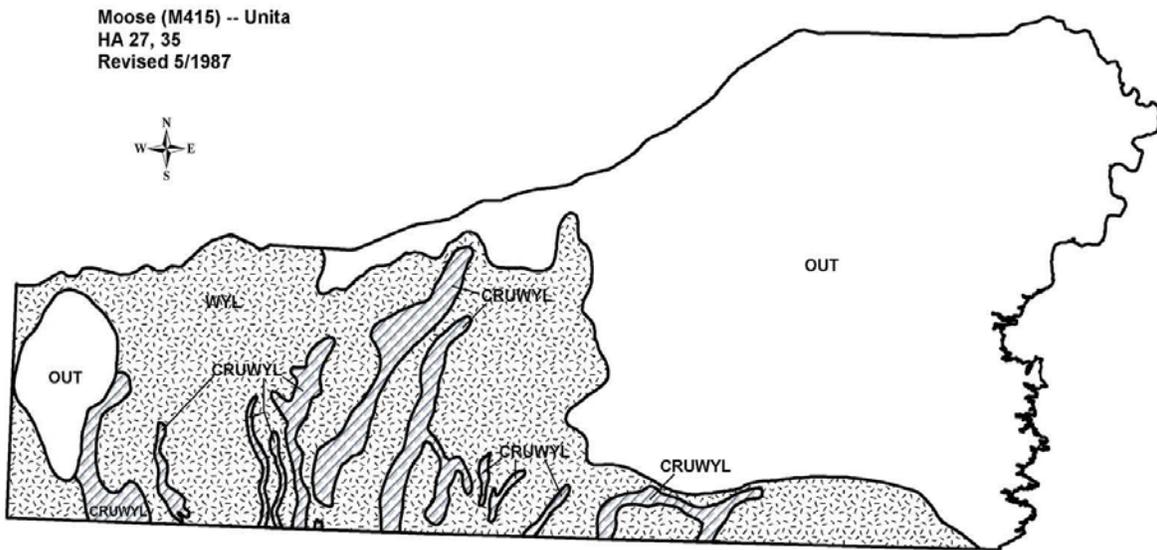
- 40% of male harvest  $\geq$  5 years of age  
(5 year average timelines for better sample sizes)

### Uinta Moose Herd Harvest Data 2012 -2016

	2012	2013	2014	2015	2016	5 year average
<b>Mean age of harvest</b>	5.0	4.333	4.125	4.37	4.18	4.4
<b>Median age of harvest</b>	4	4	3	4	4	3.8
<b>Days per harvest</b>	10.2	8.4	9.1	7.6	9.5	9.0
<b>% male harvest <math>\geq</math> 5 years</b>	45%	33%	12%	25%	45%	32%
<b>Average Antler spread (in)</b>	40.35	38.8	36.0	35.75	38.2	37.8

The Uinta Herd Unit has small sample sizes for harvest so outliers or missed samples have a large affect on the data. Currently the 5 year average for the herd is slightly below objective for Minimum age of Harvest, above objective on days per harvest and below objective on percent of male harvest  $\geq$  5 years of age.

2014 was the first year of this type of objective option. Since there are very low harvest sample sizes averages over time will be most useful. There is also an unknown amount of variation around tooth cementum analysis estimates of age. Currently, the JCR system is not set up to report this type of objective data.



## 2016 - JCR Evaluation Form

SPECIES: Moose

PERIOD: 6/1/2016 - 5/31/2017

HERD: MO417 - LINCOLN

HUNT AREAS: 26, 33, 36, 40

PREPARED BY: JEFF SHORT

	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	835	725	680
Harvest:	47	43	35
Hunters:	48	48	40
Hunter Success:	98%	90%	88%
Active Licenses:	48	48	40
Active License Success:	98%	90%	88%
Recreation Days:	382	366	290
Days Per Animal:	8.1	8.5	8.3
Males per 100 Females	54	0	
Juveniles per 100 Females	38	0	

Population Objective ( $\pm 20\%$ ) : 1000 (800 - 1200)

Management Strategy: Special

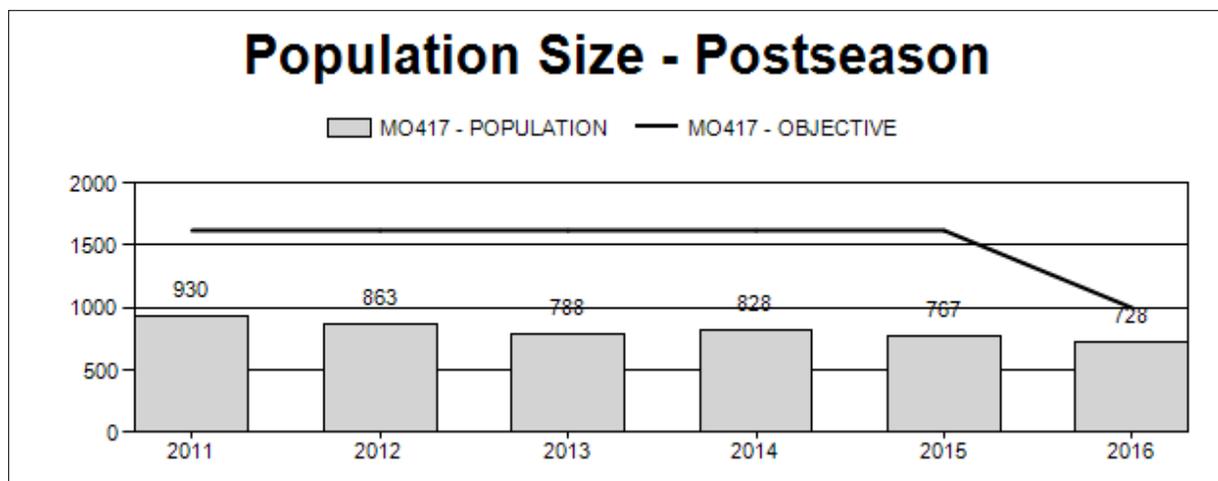
Percent population is above (+) or below (-) objective: -27.2%

Number of years population has been + or - objective in recent trend: 10+

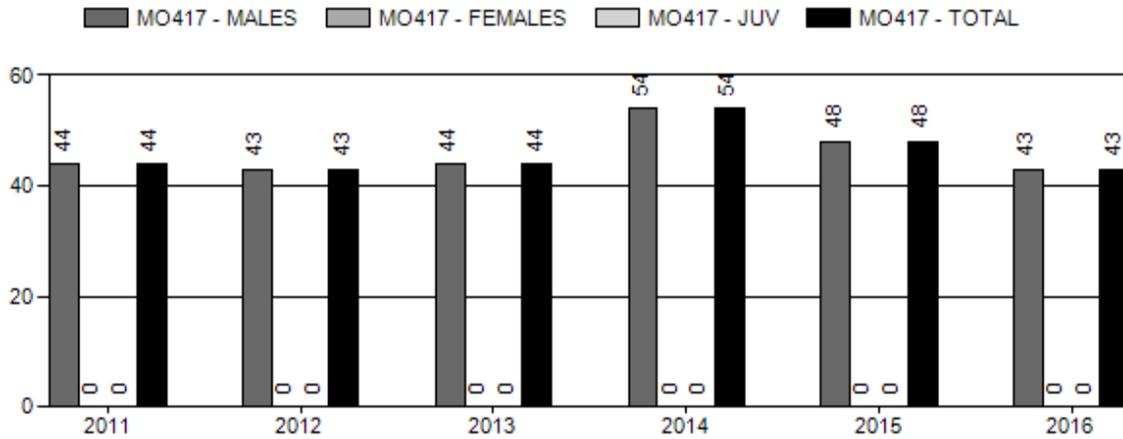
Model Date: 02/22/2017

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

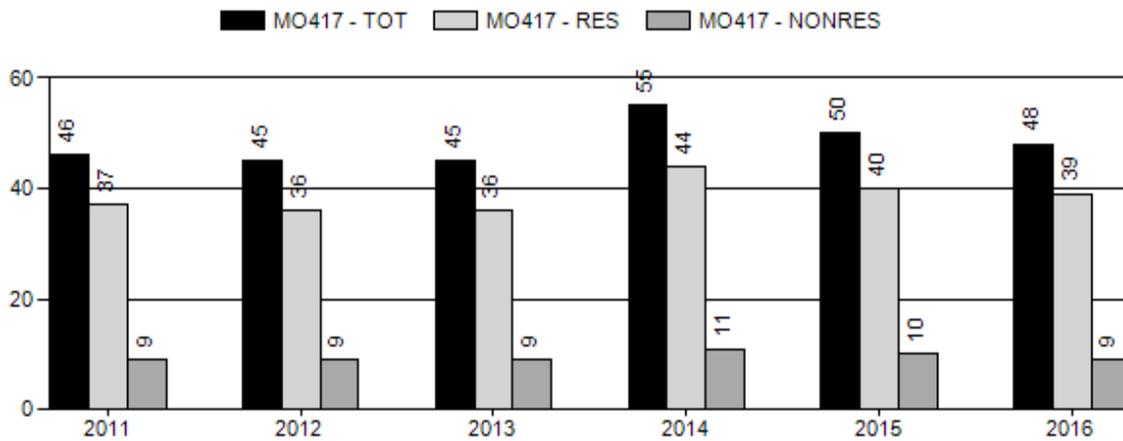
	<u>JCR Year</u>	<u>Proposed</u>
Females $\geq 1$ year old:	0%	0%
Males $\geq 1$ year old:	21.4%	20.4%
Total:	6.9%	5.0%
Proposed change in post-season population:	-6.3%	-6.3%



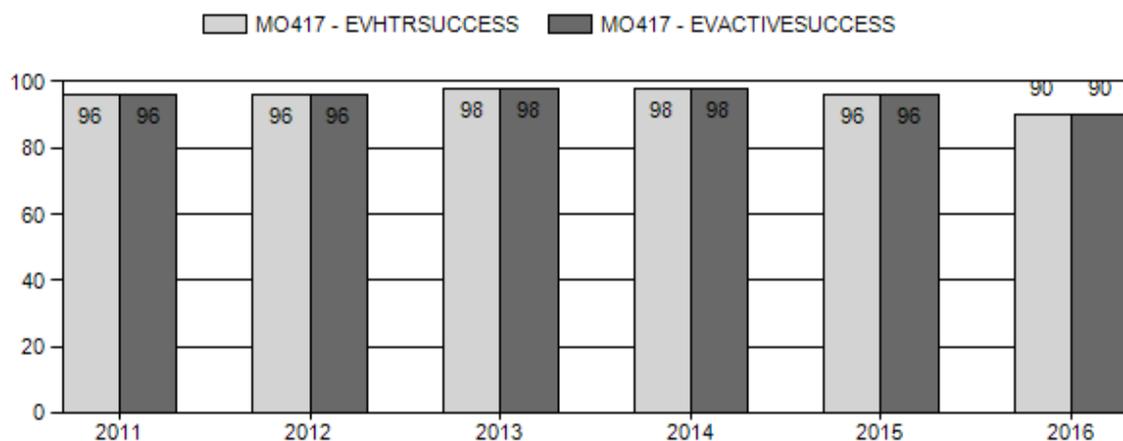
# Harvest



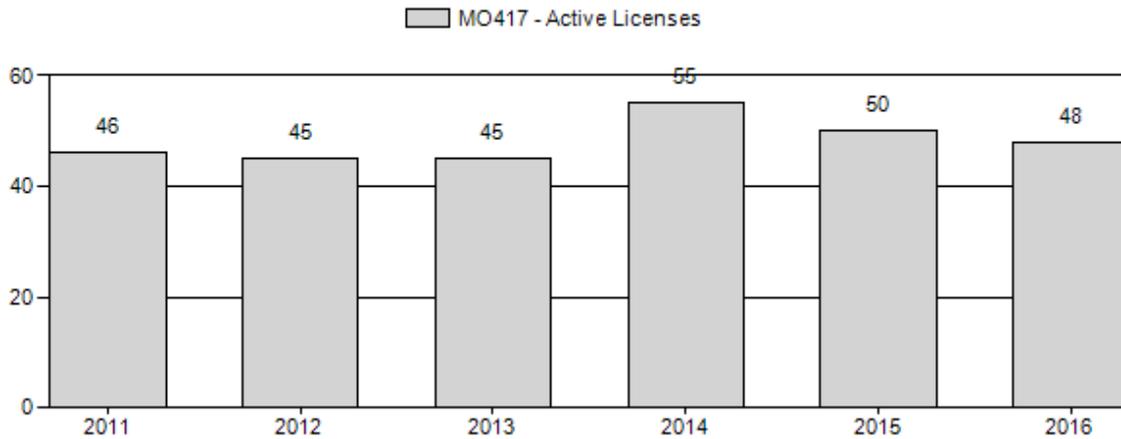
# Number of Active Licenses



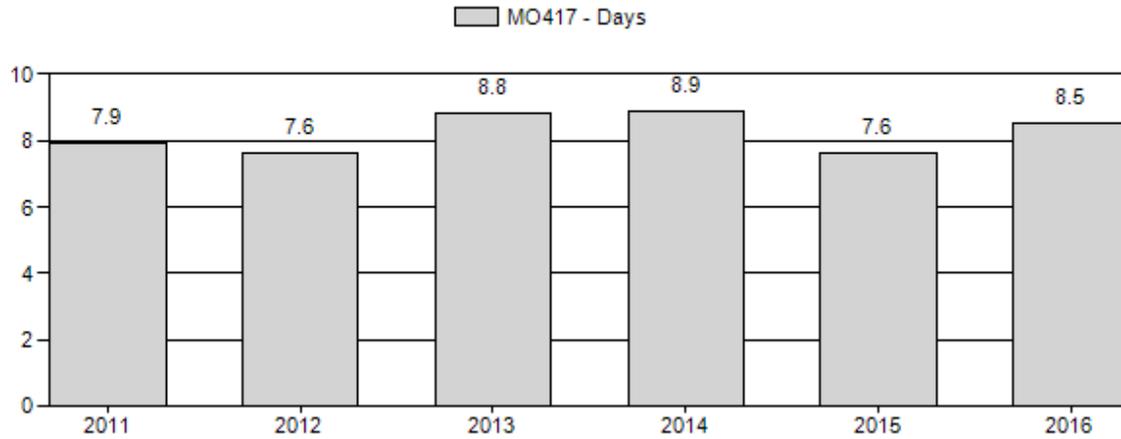
# Harvest Success



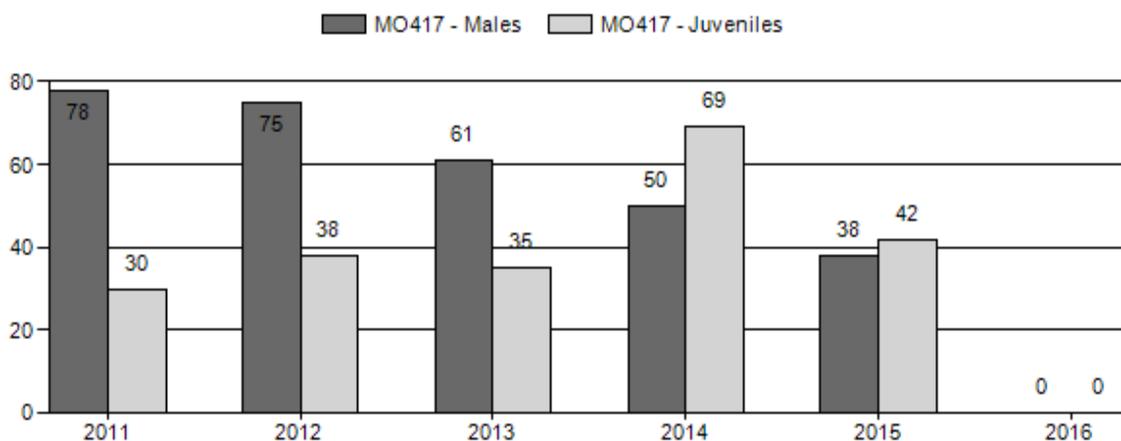
## Active Licenses



## Days per Animal Harvested



## Postseason Animals per 100 Females



**2011 - 2016 Postseason Classification Summary**

for Moose Herd MO417 - LINCOLN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females			Young to			
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	930	0	0	47	38%	60	48%	18	14%	125	0	0	0	78	± 18	30	± 10	17
2012	863	0	6	6	35%	8	47%	3	18%	17	0	0	75	75 ± 51	38	± 32	21	
2013	788	0	124	124	31%	202	51%	71	18%	397	0	0	61	61 ± 6	35	± 4	22	
2014	828	1	7	8	23%	16	46%	11	31%	35	0	6	44	50 ± 27	69	± 34	46	
2015	767	11	59	70	21%	183	55%	77	23%	330	0	6	32	38 ± 5	42	± 6	30	
2016	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0 ± 0	0	± 0	0	

**2017 HUNTING SEASON**

SPECIES : **Moose**

HERD UNIT : **LINCOLN (417)**

HUNT AREAS: **26, 33, 36, 40**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
26	1	Oct. 1	Oct. 31	32	Limited quota	Antlered moose
33						CLOSED
36	1	Oct. 1	Oct. 31	5	Limited quota	Antlered moose
40	1	Oct. 1	Oct. 31	3	Limited quota	Antlered moose

26, 36, 40 Archery Sep. 1 Sep. 30 Limited quota Refer to Section 2 of this chapter

Hunt Area	License Type	Quota change from 2016
<b>33, 36, 40</b>	<b>1</b>	<b>-10</b>
<b>36</b>	<b>1</b>	<b>+5</b>
<b>40</b>	<b>1</b>	<b>+3</b>
<b>26</b>	<b>1</b>	<b>-8</b>
Herd Unit Total	<b>1</b>	<b>-10</b>

**Management Evaluation**

**Current Postseason Population Management Objective: 1,000**

**Management Strategy: Special**

**2016 Postseason Population Estimate: ~728**

**2017 Proposed Postseason Population Estimate: ~683**

## **Herd Unit Issues**

This moose herd, like other moose populations in Wyoming and in most southern latitudes, has shown a marked decline in the last two decades. A portion of the lower elevation riparian moose habitat is on private land so landowner tolerance of moose can be an issue, and damage complaints are common. Moose entering towns and residing in yards has also been a considerable issue in this herd in the past, but is less so now, with reduced moose abundance. This herd unit is not a closed population with the northeast boundary line being through prime moose habitat.

Parasite caused mortalities have been a significant issue in this population, with noticeable declines in abundance and distribution. The fact this decline is of unknown magnitude complicates management and impacts population estimation efforts. We have documented several cases of elaeophorosis and keratoconjunctivitis in this population and believe this may have had a significant population effects on the herd. Additionally, ghost tick infestations are occurring, which can increase winter related mortality. Losses to these diseases appear to have stabilized, at least the number of reports received have. Moose tend to die from elaeophorosis during the summer and are often overlooked given their propensity for moving into backcountry areas. Only when they are infected in accessible areas do we receive reports. Most moose checked have the presence of the parasite in this herd. We are continuing conservative management in this herd until we observe increase in moose numbers and objectives are achieved.

Moose are of greatest abundance in the northernmost area of this herd unit; area 26. The northern boundary of this area is prime moose habitat, and it makes little sense to assume interchange of significant amount does not occur with the areas to the north. The remaining areas in the herd have much lower moose abundance and limited moose habitats, primarily associated with riparian river bottoms or scattered patches of suitable timber. Hunt area 36 has low densities of moose scattered over a large expanse of non-typical open moose habitat, dominated by mixed mountain shrubs and isolated patches of conifer (primarily subalpine fir) and aspen. This area acts as a dispersal area for adjacent larger populations of moose in the Uinta and Lincoln herds. The young average age of animal harvested there supports our concept that younger age class animals are move into this area to occupy empty home ranges. Moose in areas 33 and 40 occur primarily along major drainages only, including the Green River in area 33, and the Black's Fork and Ham's Fork in area 40. Given low numbers of moose area 33 had been closed for hunting from 2003 to 2013, was opened for the 2014-2016 seasons, and is closed again in 2017.

## **Weather**

Weather during 2016 and 2017 was highly variable, ranging from an exceptionally mild winter in 2015-16 to the most severe winter since 1928 in 2016-17. Moose are little impacted by winter conditions unless weakened by disease or parasites. We likely lost some moose to starvation or parasites this winter, especially ghost tick.

## **Habitat**

Habitat data has been inconsistently collected in this herd unit in the recent past. Known issues of decadence occur among willow habitats in area 26, 33, and 40, and some areas have received fairly heavy browsing pressure in past years. A renewed effort to quantify habitats throughout this herd is underway, as are efforts to address concerns of willow and aspen stand condition through habitat projects. Results of Rapid Habitat Assessment work will be included in this report in 2017.

## **Field Data**

Moose surveys are conducted in hunt area 26 from a helicopter concurrent with West Green River elk surveys. Classification data is collected during these flights. Those surveys are conducted every other year. Areas 33, 36 and 40 are not flown due to the large geographic area and very low moose densities. The joint elk and moose survey was flown in the winter of 2015/16. Total number of moose observed during this flight was 331. The Idaho sightability model was used to estimate a total population for the area flown. That estimate was 383 moose with a standard error of 12.41. Very good coverage of occupied moose winter habitat was achieved in the survey. However, there are some peripheral habitats that were not flown due to budget constraints. For population modeling we have added 50 animals to the estimate and enlarged the SE to account for those areas. The previous survey was flown in the winter of 2013/14 and resulted in a raw count of 406 moose with a sightability estimate of 476. In the off years between elk/moose flights, some moose classification data is collected during aerial deer surveys in December. That data is reported in the JCR report graphs and tables but sample sizes are inadequate and ratios are not reliable. The extensive surveys conducted in 2014 and 2016 resulted in estimates that are lower than survey sample sizes were in the late 1990s and early 2000s with lower effort back then. This substantiates field observations that moose populations were greatly reduced around 2006/2007. Reduced habitat condition and disease were likely responsible for population reduction.

## **Harvest Data**

Antlerless harvest opportunity has been very limited in this herd unit, and was finally eliminated. We have dramatically reduced the number of licenses in the last 10 years due to the population decline. Antlered moose hunters still have very good success rates, which is typical for this species, even during periods of low density and abundance. Hunt area 26 is considered a very good quality moose hunt with potential for trophy animals. Area 26 has ample public access and a variety of places to hunt moose. Hunts in areas 33, 36 and 40 are considered good hunts with good success rates but require more time to find moose spread out over large areas, many of which are privately owned. Public access can be more challenging in these areas but access to moose hunting is available. They are not typically considered trophy areas but mature animals do exist and are harvested. Harvest data from 33, 36 and 40 does not give us much information since sample sizes are very small. In Hunt area 26 harvest data has a better sample size. Tooth age data from Area 26 indicates we have an average age of harvest of 3.2 years old for 2016. Average antler spread in Hunt Area 26 was 35.20 for 2016.

## Lincoln Moose Herd Harvest Data 2012 -2016

	2012	2013	2014	2015	2016	5 year average
<b>Mean age of harvest</b>	4.4	4.4	4.1	3.6	3.2	3.9
<b>Median age of harvest</b>	5	4	4	4	3	4
<b>Days per harvest</b>	7.6	8.8	8.9	7.6	8.5	8.28
<b>% male harvest ≥ 5 years</b>	52%	43%	34%	20%	12%	32%
<b>Average Antler spread (in)</b>	37.63	36.12	37.84	37.40	35.20	36.8

### 2011 - 2016 Harvest Summary

for Moose Herd MO417 - LINCOLN

Year	HUNTERS					HARVEST										SUCCESS			
	Res Htrs	NRes Htrs	% NRes	Total Htrs	Act Lic	Ylg Male	Adult Male	Total Male	% Male	Fem	% Fem	Juv	% Juv	Tot Harv	Hntrs	Act Lic	Hntr Days	Days to Harv	
2011	37	9	20%	46	46	0	44	44	100%	0	0%	0	0%	44	96%	96%	348	7.9	
2012	36	9	20%	45	45	0	43	43	100%	0	0%	0	0%	43	96%	96%	326	7.6	
2013	36	9	20%	45	45	0	44	44	100%	0	0%	0	0%	44	98%	98%	386	8.8	
2014	44	11	20%	55	55	0	54	54	100%	0	0%	0	0%	54	98%	98%	482	8.9	
2015	40	10	20%	50	50	0	48	48	100%	0	0%	0	0%	48	96%	96%	366	7.6	
2016	39	9	19%	48	48	0	43	43	100%	0	0%	0	0%	43	90%	90%	366	8.5	

## Population

Prior to 2015, there was no recent working model for this moose population. It was not possible to build a reasonable model with the available data. With the new sightability estimates we now have 2 population estimate data points to anchor the model, a spreadsheet version adopted in 2012 to replace POP-II. The reader should be cautioned this new model is to be used with a great deal of caution. This modeling technique is not designed to be used for moose populations. It is based on an elk population model and some parameters may be different. With a new model, population trends will often be unrealistic in the early timeframe as the model works to try to normalize and accommodate the data. Results should be truncated and all focus placed on the last few years of model estimates, which are anchored by aerial population estimates. The reported model is for hunt area 26 only. It is not feasible to collect adequate data for modeling in the remainder of the herd unit. Total herd unit estimates in the JCR are reported as model estimates plus ~120 animals to account for the overall objective.

The CJ,CA model was selected due to the low Relative AICc score, and its relatively good fit with the data. The CJ,CA model fits reasonably within the population characteristics of moose. In the future it will be important that we obtain a population estimate periodically to proof the status of the herd and anchor the model. Without this anchor, it is unlikely we can provide a working population model and track the trend of this population.

For several consecutive years in Area 26 we saw very low numbers of moose on post-season classification surveys. This was very concerning considering counting conditions were ideal in several of those surveys. We had also experienced a reduction in nuisance moose complaints and reduced field observations of moose. This information prompted us to reduce harvest on this herd significantly during that time.

## **Management Summary**

2016 seasons remained conservative for the hunting season, and we are proposing to become even more conservative in 2017. We now have the ability to issue licenses in a split quota style, wherein we are not required to issue license per area in increments of 5 to accommodate the nonresident quota, as long as these percentages balance on a statewide manner, similar to how we have issued wild sheep licenses. For the 2017 season in area 26, we reduced licenses from 40 to 32, given the area has fallen below objective in bull:cow ratio and mean age of harvested bulls. In Hunt Areas 33, 36 and 40 we split the hunt areas into separate licenses per area (they were combined in 2016). We authorized 5 licenses in area 36 and 3 licenses in hunt area 40. Hunt Area 33 will again be closed.

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