2016 - JCR Evaluation Form

SPECIES: Moose
PERIOD: 6/1/2016 - 5/31/2017
HERD: MO101 - TARGHEE
HUNT AREAS: 16, 37
PREPARED BY: ALYSON COURTEMANCH

	2011 - 2015 Average	2016	2017 Proposed
Harvest:	5	5	5
Hunters:	5	5	5
Hunter Success:	100%	100%	100 %
Active Licenses:	5	5	5
Active License Success:	100%	100%	100 %
Recreation Days:	43	12	30
Days Per Animal:	8.6	2.4	6
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	

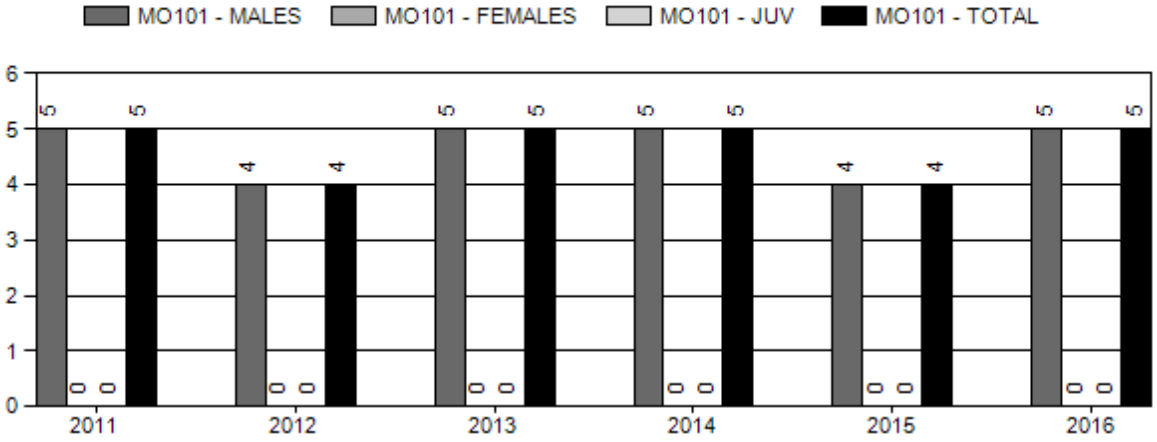
Management Strategy:	Special
Percent population is above (+) or (-) objective:	0%
Number of years population has been + or - objective in recent trend:	0

Population Objective Type: Limited Opportunity

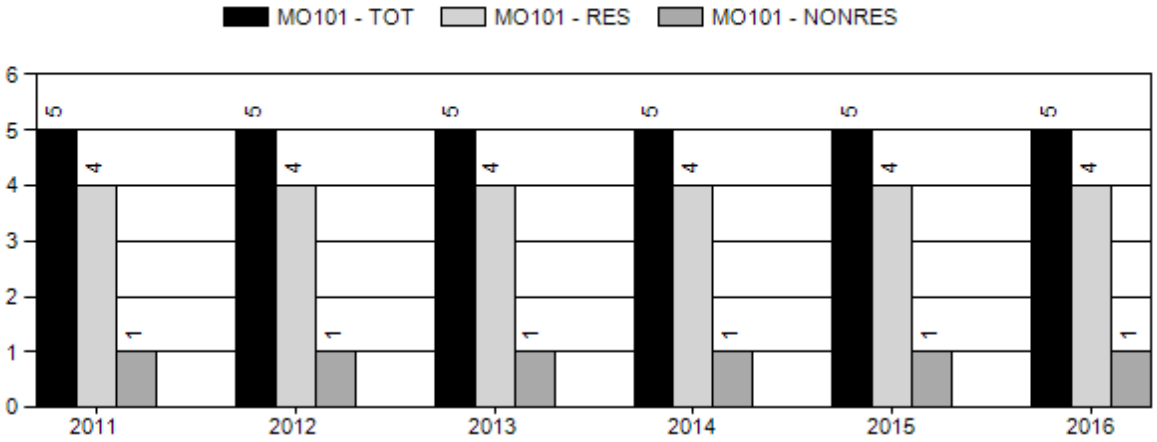
Primary Objectives:
1. Achieve a 5-year median age of ≥ 4.5 years for harvested moose, and
2. Achieve a 5-year average of ≤ 12 days/animal to harvest.

Secondary Objective:
Achieve a 5-year average of 40% of harvested moose are > 5 years of age.

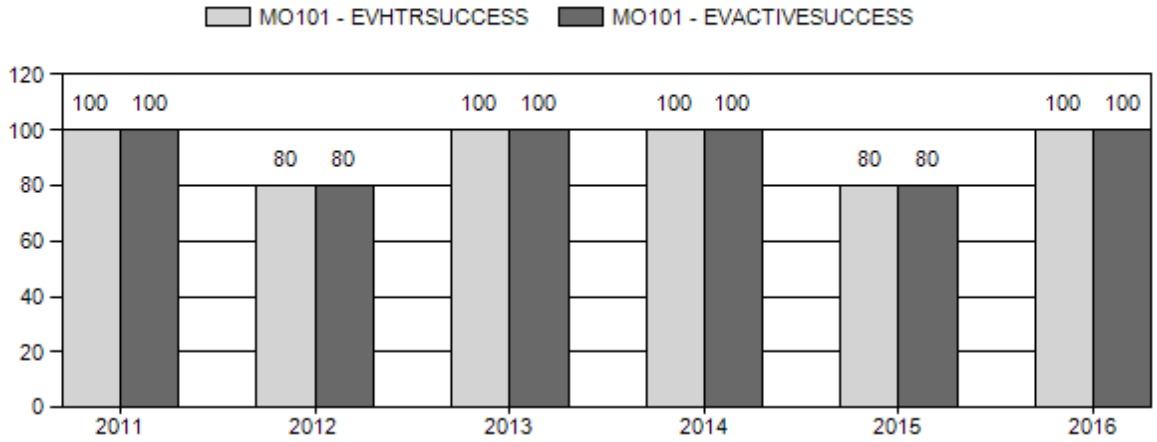
Harvest



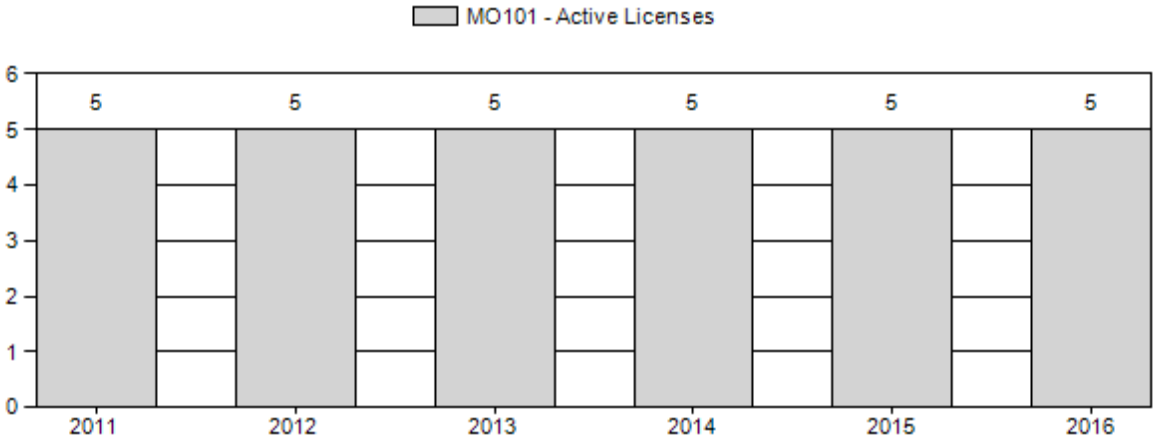
Number of Hunters



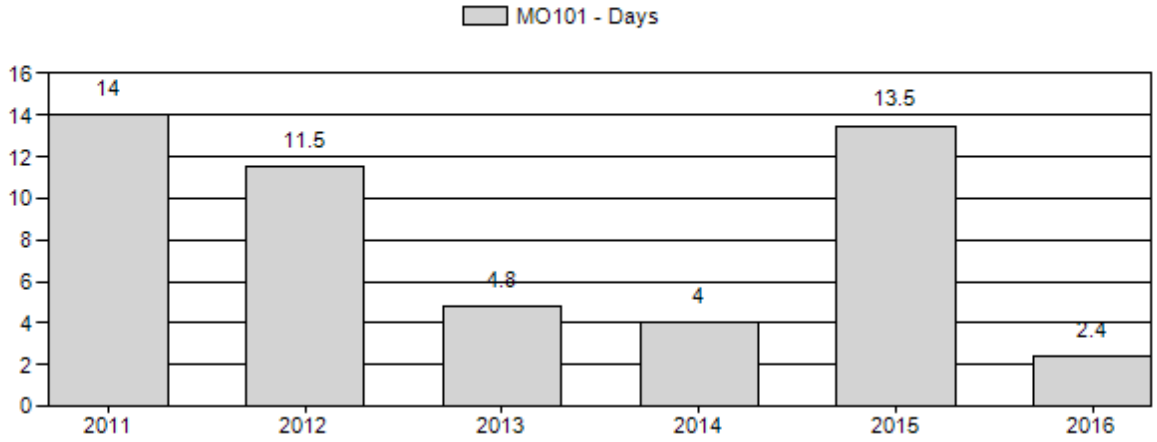
Harvest Success



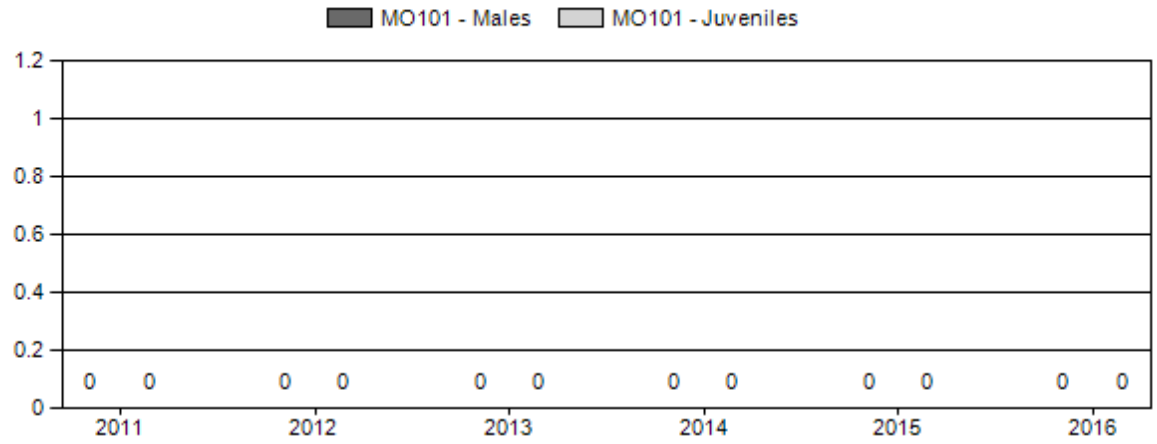
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2017 HUNTING SEASONS
TARGHEE MOOSE HERD (MO101)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
16, 37	1	Sep. 15	Nov. 15	5	Limited quota	Antlered moose

Special Archery Seasons

Hunt Area	Season Dates	
	Opens	Closes
16, 37	Sep. 1	Sep. 14

Management Evaluation

Management Strategy: Special

Population Objective Type: Limited Opportunity

Primary Objectives:
1. Achieve a 5-year median age of ≥ 4.5 years for harvested moose, and
2. Achieve a 5-year average of ≤ 12 days/animal to harvest.

Secondary Objective:
Achieve a 5-year average of 40% of harvested moose are > 5 years of age.

The Wyoming Game and Fish Department (WGFD) proposed changing the objective for the Targhee Moose Herd from a postseason population objective to a limited opportunity objective in 2014. The objective change was needed because the herd is rarely surveyed due to budget priorities elsewhere, difficult sightability due to forested habitats, and spreadsheet models do not appear to adequately simulate observed population trends. In addition, the interstate nature of the herd poses additional challenges to population surveys and management. A limited opportunity objective was adopted in 2014 after public review, and included primary and secondary objectives (listed above).

In 2016, the median age of harvested moose was 9.5 years (n = 3 samples, range = 2.5-10.5 years old). The median age of harvested moose for the past 5 years is 4.5 years old (n = 15 samples) (Fig. 1). Therefore, the first primary objective of a 5-year median age of ≥ 4.5 years for harvested moose is currently being met.

In 2016, the average number of days per animal to harvest was 2.4. This is the lowest during the last 5 years. The 5-year average of number of days per animal to harvest is 7.2 days (Fig. 2). Therefore, the second primary objective of a 5-year average of ≤ 12 days/animal to harvest is currently being met.

In 2016, three hunters submitted tooth samples from harvested moose for aging. Two moose were > 5 years of age (9 and 10 years old) and one moose was < 5 years of age (2 year-old). During the past 5 years, 15 hunters have submitted tooth samples for aging. Of those, 7 moose were aged at > 5 years (6.5, 7.5, 9.5, 9.5, 10.5, 10.5, and 10.5 years). Therefore, the secondary objective of at least 40% of harvested moose being > 5 years of age is currently met, although sample sizes are low (Fig. 3).

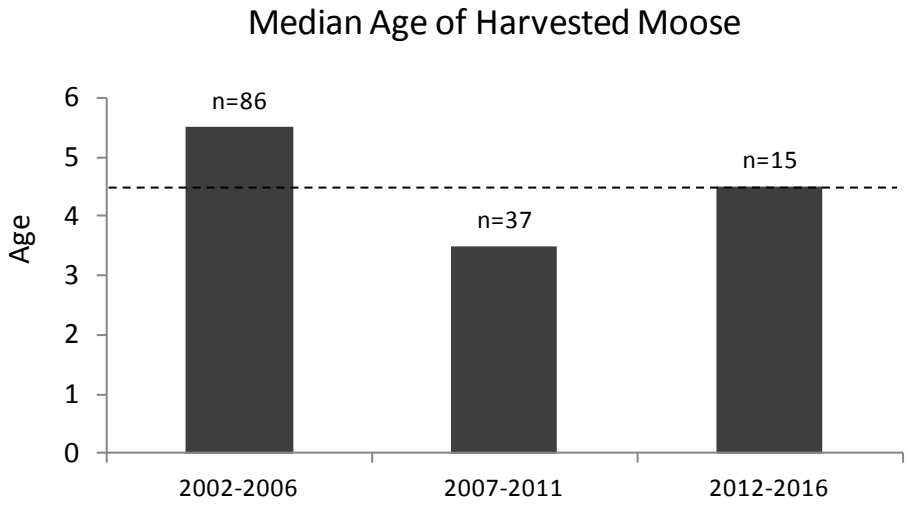


Fig. 1. Median age of harvested moose in the Targhee Herd in 5-year periods, from 2002-2016. The dashed line indicates the objective of ≥ 4.5 years old.

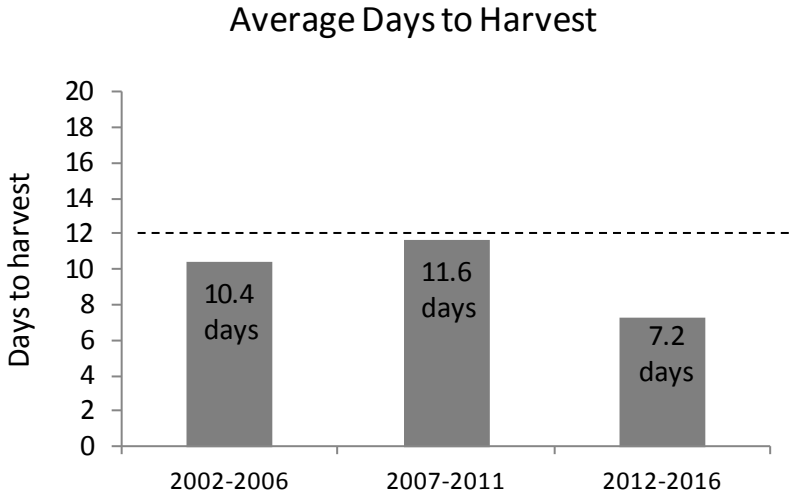


Fig. 2. Average number of days per animal harvested in the Targhee Moose Herd, from 2002-2016. The dashed line indicates the objective of ≤ 12 days per animal harvested.

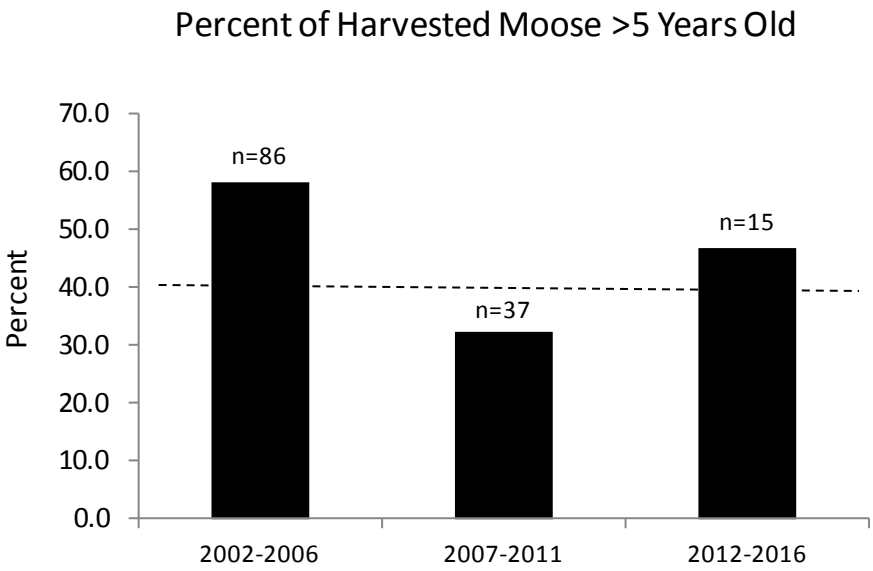


Fig. 3. Percent of harvested moose in the Targhee Moose Herd that are over 5 years old, from 2002-2016. The dashed line indicates the objective of > 40%.

Herd Unit Issues

Spreadsheet models developed for this moose herd do not appear to adequately simulate observed trends. This population is very difficult to survey and manage through harvest due to its interstate nature. Post-season classification surveys are not flown in this herd due to budget constraints and sightability issues in forested habitats. However, moose were opportunistically recorded during an aerial survey of the Targhee bighorn sheep herd in March 2015. Two cows, 2 calves, 5 bulls, and 1 unclassified adult were observed. Winter ranges are primarily low elevation mountain shrub and aspen communities and riparian willow and spruce/fir communities. On more severe winters, moose may move west along riparian corridors toward the Teton River in Idaho. Many of the mountain shrub and aspen communities along the state line are old and decadent. Serviceberry, chokecherry, and mountain mahogany are often over 10 feet tall, above the browse zone for moose. Harvest was as high as 70 moose in 1990 and 1991. License quotas were then decreased as harvest statistics and public comments indicated the population was decreasing. The license quota has been 5 antlered moose in recent years.

Weather

Summer 2016 was very dry. Precipitation in July was only 50% of average. September and October were rainy, resulting in a late-season flush of forage production. November was relatively warm and mild with no significant snowfall until early December. However, the region received significant snowfall and freeze/thaw events in late December through January, causing severe winter conditions. These conditions caused moose to concentrate at low elevations. Several rain events and warmer temperatures in February resulted in slopes melting out in some

areas on native winter ranges. At the time of the mid-winter survey in February 2017, winter snowpack was reported at 131% of average in the Snake River Basin. Please refer to the following web sites for specific weather station data.
http://www.wrds.uwyo.edu/wrds/nrcs/snowprec/snowprec.html and
http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html

Habitat

There are no permanent vegetation transects in moose winter ranges for the Targhee Herd. Several habitat improvement projects are being planned in this herd unit, including the Hill Creek Prescribed Burn, which is scheduled for completion in 2016. In addition, a habitat treatment in Teton Canyon is currently in the planning stages to improve mountain shrub and aspen communities for moose and other big game. The WGFD is assisting Caribou-Targhee National Forest (CTNF) with vegetation monitoring in aspen stands pre and post-treatment. Please refer to the 2016 Annual Report Strategic Habitat Plan Accomplishments for Jackson Region habitat improvement project summaries (https://wgfd.wyo.gov/Habitat/Habitat-Plans/Strategic-Habitat-Plan-Annual-Reports).

Field Data

There were no field data collected in the Targhee Herd Unit during the 2016 biological year.

Harvest Data

To offset observed population declines, antlerless harvest was eliminated from the Targhee moose herd in 2006 and the two hunt areas were combined in 2011. In spite of these changes the moose population did not increase significantly. Data from the 2016 harvest survey indicate that 5 hunters harvested 5 bulls (100% success). Harvest success has been consistently high for the past 5 years (>80%). The average number of days to harvest was high in 2015 at 13.5 days but decreased in 2016 to 2.4 days. Average days to harvest each year can fluctuate based on hunter effort and selectivity. In 2016, three hunters submitted tooth samples from 2.5, 9.5, and 10.5 year-old moose. Although the sample size is low, these ages indicate that older age classes are present in the population. In 2016, average antler width of harvested moose was 38.5 inches (max = 46.5 inches).

Population

Due to budget constraints, there have been no mid-winter surveys in the Targhee herd since 2009. Based on the 2009 survey this population is likely 150-200 moose. Similar to the Jackson moose herd this population appeared to decline during the early 2000s.

Management Summary

Due to the “interstate” nature of this population, managing this herd is difficult. Moose along the state line spend summer and early fall in Wyoming and winter along drainages in the foothills of the Teton Range. The population has not responded to hunting season changes and it is likely that numerous factors are influencing recruitment and survival of moose in this population, including long-term drought, warming climate, parasites, disease, and predation. Managers plan to maintain limited hunting opportunity west of the Teton Range. The herd unit continues to offer high quality antlered moose hunting, and hunter success and effort from the past few years suggest this population may be increasing. Managers are not proposing an increase to licenses in 2017 but will continue to monitor average age and harvest statistics. Additional effort to contact hunters and increase tooth sample returns will be made. The WGFD continues to work closely with CTNF to develop habitat improvement projects for moose and other big game species.

2016 - JCR Evaluation Form

SPECIES: Moose | PERIOD: 6/1/2016 - 5/31/2017

HERD: MO103 - JACKSON

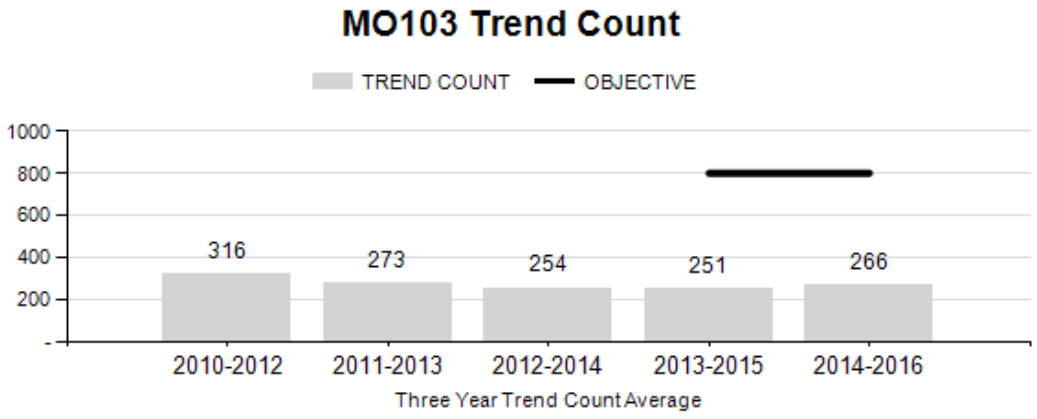
HUNT AREAS: 7, 14-15, 17-19, 28, 32 | PREPARED BY: ALYSON COURTEMANCH

	2011 - 2015 Average	2016	2017 Proposed
Trend Count:	258	330	350
Harvest:	10	10	10
Hunters:	12	10	10
Hunter Success:	83%	100%	100 %
Active Licenses:	12	10	10
Active License Success	83%	100%	100 %
Recreation Days:	75	84	75
Days Per Animal:	7.5	8.4	7.5
Males per 100 Females:	86	72	
Juveniles per 100 Females	34	46	

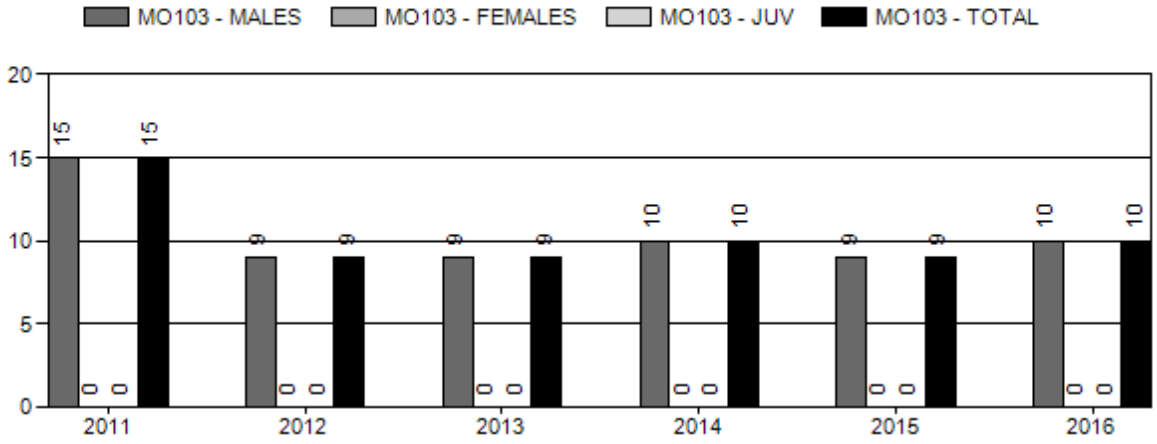
Trend Based Objective (± 20%)	800 (640 - 960)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-58.8%
Number of years population has been + or - objective in recent trend:	20

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

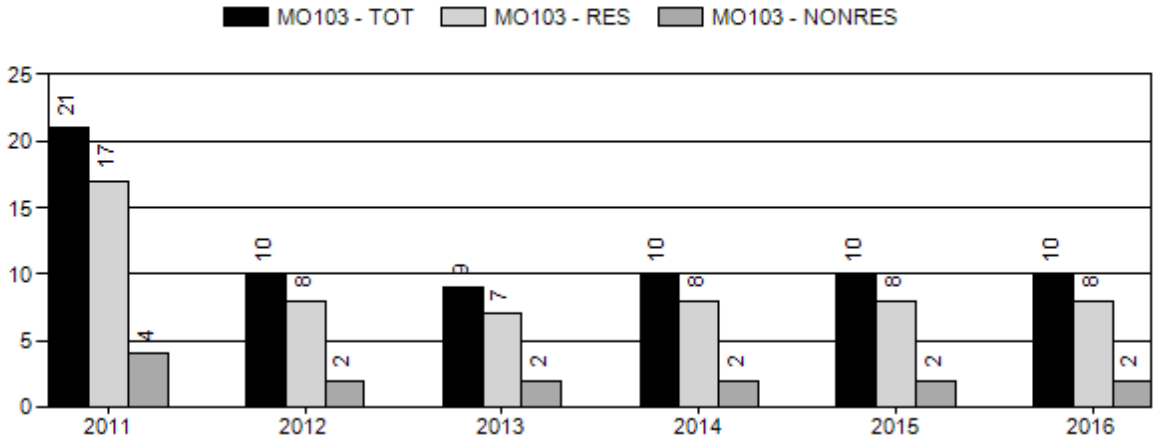
	JCR Year	Proposed
Females ≥ 1 year old:	na%	na%
Males ≥ 1 year old:	na%	na%
Juveniles (< 1 year old):	na%	na%
Total:	na%	na%
Proposed change in post-season population:	na%	na%



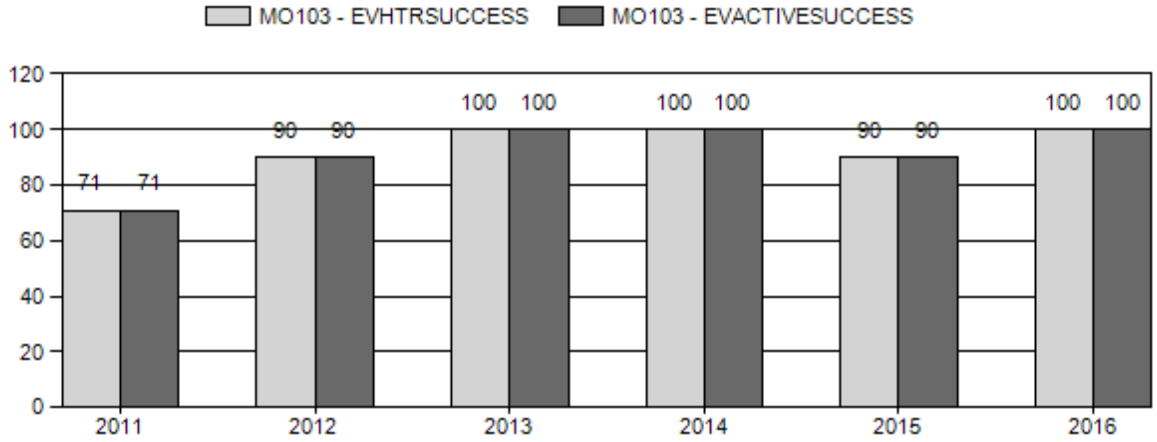
Harvest



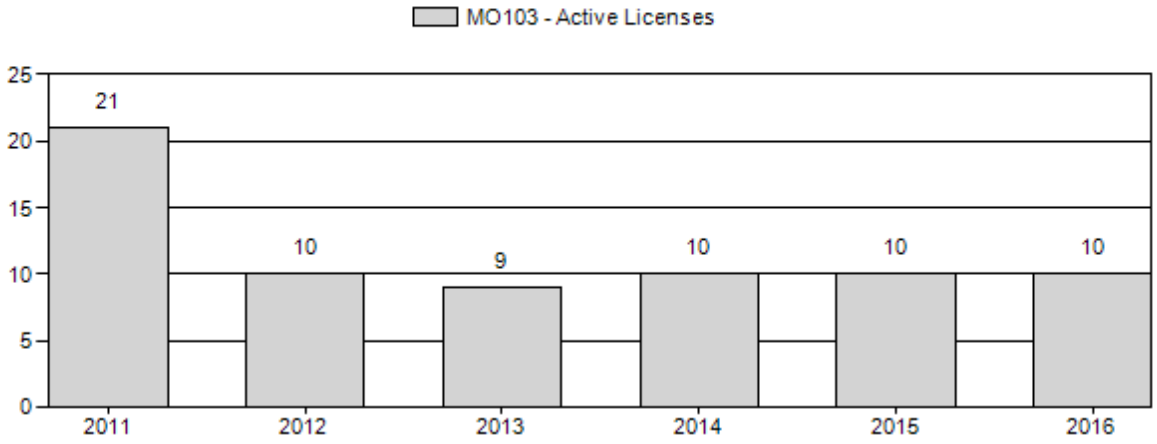
Number of Hunters



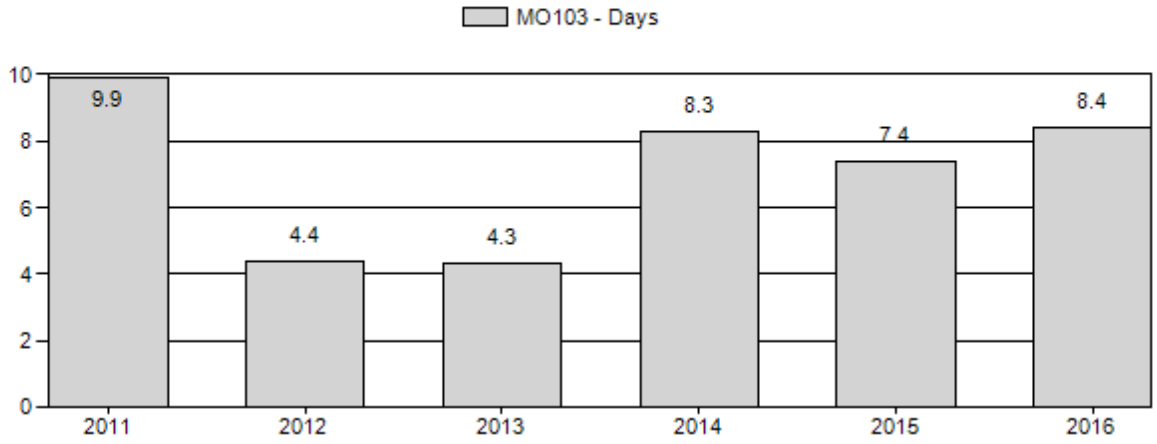
Harvest Success



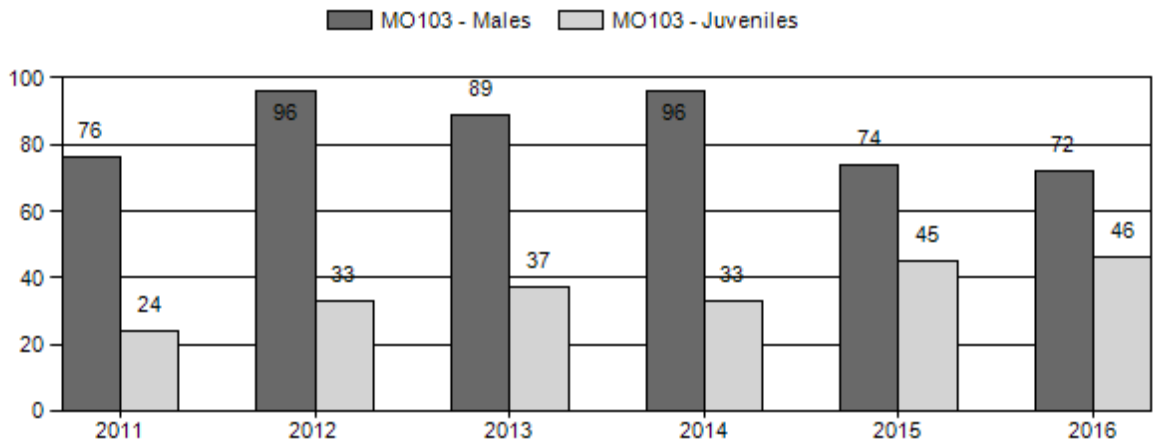
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Moose Herd MO103 - JACKSON

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	896	0	0	113	38%	149	50%	36	12%	298	389	0	0	76	± 10	24	± 5	14
2012	500	0	0	99	42%	103	44%	34	14%	236	389	0	0	96	± 13	33	± 6	17
2013	500	0	112	112	39%	126	44%	46	16%	284	416	0	89	89	± 10	37	± 5	19
2014	450	0	101	101	42%	105	44%	35	15%	241	389	0	96	96	± 12	33	± 6	17
2015	231	0	77	77	34%	104	46%	47	21%	228	395	0	74	74	± 0	45	± 0	26
2016	330	0	108	108	33%	149	46%	69	21%	326	280	0	72	72	± 0	46	± 0	27

2017 HUNTING SEASONS
JACKSON MOOSE HERD (MO103)

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
7, 14, 15, 19, 32						CLOSED
17, 28	1	Sep. 15	Oct. 31	5	Limited quota	Antlered moose
18	1	Oct. 1	Oct. 31	5	Limited quota	Antlered moose

Special Archery Seasons

Hunt Area	Dates of Seasons	
	Opens	Closes
17, 28	Sep. 1	Sep. 14
18	Sep. 1	Sep. 30

Summary of Changes in License Number

Area	Type	Quota change from 2016
17, 28, 18	1	No Changes
Herd Unit Total	**1**	**No Changes**

Management Evaluation

Mid-Winter Trend Count Objective: 800
Secondary Objectives:

1. Maintain a 5-year running average of at least 40% of male harvest ≥ 5 years of age, and
2. Maintain a 3-year median age of ≥ 4.5 years old for harvested moose.

Management Strategy: Special
2016 Mid-Winter Trend Count: 330
3-Year Mid-Winter Trend Average (2014-2016): 266

The mid-winter trend count objective for the Jackson Moose Herd is 800 moose. The management strategy is special and the objective and management strategy were last revised in 2015. The herd objective was publicly reviewed in 2015 and changed to a mid-winter trend count objective of 800 moose. The 2016 current trend count is 330 moose and the 3-year average is 266 moose, which is well below the objective. This year's trend count was about 100 moose higher than last year, likely due to severe winter conditions with deep snow that congregated moose in willow riparian areas and increased sightability during helicopter surveys.

The first of the secondary management objectives is currently not being met. The average percent male harvest ≥ 5 years of age from 2012-2016 was 38.5% (n = 31 samples). The second of the secondary objectives is currently being met. The 3-year median age for harvested moose is 4.5 years (n=20) for 2014-2016. In general, managers would like to see the average age of harvested moose increase in the herd unit.

Herd Unit Issues

This population is 59% below its mid-winter trend count objective of 800 moose. Native moose populations naturally expanded and colonized the Jackson area in the late 19th century. The species' arrival was followed by a classic exponential population increase, peaking at approximately 3,000-5,000 animals (depending on modeling techniques). For many years, the Jackson Herd served as a source for moose transplants in multiple states and supported nearly 500 hunting licenses. However, the population underwent a dramatic population crash beginning in the early 1990s. Despite drastic reductions in hunting licenses, the population has failed to recover and continues to decline. Research on moose in the northern portion of the herd unit indicated that a number of factors are influencing this population (Houston 1968, Berger 2004, Becker 2008, Vartanian 2011). Similar to other moose herds throughout the western United States and New England, the Jackson Herd is impacted by a combination of factors, including long-term drought, severe wildfires, a warming climate, predation, parasites, and disease. Moose in the Jackson Herd are exposed to predation by several large carnivore species. Large scale wildfires during the late 1980s and more recently have influenced summer moose habitat. Parasites such as carotid artery worm and winter ticks, as well as re-colonization by large carnivores pose additional challenges. In spite of hunting season closures and a reduction in the number of licenses, this population has not responded to management changes. Calf ratios have shown a promising upward trend in recent years. Ratios were as low as 15 calves:100 cows in 2008 but were 45:100 and 46:100 in 2015 and 2016, respectively.

Weather

Summer 2016 was very dry. Precipitation in July was only 50% of average. September and October were rainy, resulting in a late-season flush of forage production. November was relatively warm and mild with no significant snowfall until early December. However, the region received significant snowfall and freeze/thaw events in late December through January, causing severe winter conditions. These conditions caused moose to concentrate at low elevations in willow riparian habitats and near human development, increasing sightability during the mid-winter trend count. Several rain events and warmer temperatures in February resulted in slopes melting out in some areas. At the time of the mid-winter survey in February 2017, winter snowpack was reported at 131% of average in the Snake River Basin. Please refer to the following web sites for specific weather station data.
http://www.wrds.uwyo.edu/wrds/nrcs/snowprec/snowprec.html and
http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html

Habitat

Recent vegetation monitoring indicates that moose winter ranges are slowly improving north of Jackson after decades of over-browsing in the 1980s and 1990s. Summer habitat has been modified by several large-scale wildfires in recent years, greatly reducing thermal cover for moose. The lightning-caused Berry Fire started in northern Grand Teton National Park in July 2016 and burned 20,825 acres in the Berry Creek, Owl Creek, Flagg Ranch, and western Teton Wilderness areas.

The Wyoming Game and Fish Department (WGFD) and Bridger-Teton National Forest (BTNF) initiated a project to monitor the short-term and long-term nutritional changes in moose forage species after wildfire at different severities. This project will track the nutritional content over 10 years of key forage species that burned at several fire severities during the Red Rock Fire in the Gros Ventre in 2011. Also, a current study by a doctoral student at the Wyoming Cooperative Research Unit (Brett Jesmer) is further investigating relationships between habitat condition and moose population performance statewide, including the Jackson herd. Please refer to the 2016 Strategic Habitat Plan Annual Report for Jackson Region habitat improvement project summaries (https://wgfd.wyo.gov/Habitat/Habitat-Plans/Strategic-Habitat-Plan-Annual-Reports).

Field Data

In February 2017, classification surveys were flown over low elevation moose winter ranges. We observed 330 moose this year. This total is about 100 moose higher than the 2015 classification of 231 moose. The calf ratio increased this year to 46 calves:100 cows, which is higher than the 2015 ratio (45:100) and 2014 ratio (33:100). This ratio has been slowly improving since 2008 when a ratio of 15:100 was observed. Notably, calf ratios improved in the Buffalo Valley/Spread Creek area (60 calves:100 cows) where they have been low for years. The overall bull ratio also remained high this year at 72:100.

Twenty-seven calf/cow pairs were observed in the Gros Ventre plus two cows with twin calves each, for a calf:cow ratio of 40:100. Twenty calf/cow pairs were observed in the Buffalo Valley and Spread Creek plus two cows with twin calves each. Bull ratios continue to be strong in the Gros Ventre where open hunt areas are located with 62 bulls:100 cows.

Moose densities in the Willow Flat/Oxbow Bend Area have declined from an average of 4 moose per km^2 in 2000 to 0.16 moose per km^2 in 2010 and 2012. No moose were observed in the Willow Flats area during the February 2017 classification flight. The density of moose has also declined on winter ranges in the Buffalo Valley area. Houston (1968) documented winter moose densities as high as 50 moose per square mile. In recent years, the highest densities observed are 12-17 moose per square mile.

Harvest Data

During the 2016 season, 10 hunters harvested 10 bull moose in the Jackson Herd in Hunt Areas 17/28 and 18 in the Gros Ventre drainage. During 2016, hunter success remained high at 100% and hunter effort was 8.4 days per animal compared to 7.4 days in 2015 and 8.3 days in 2014. Three hunters from Area 17/28 and three hunters from Area 18 submitted tooth samples and antler widths from harvested moose. Moose harvested from Area 17/28 were 4, 4, and 7 years old and moose harvested from Area 18 were 2, 2, and 7 years old. Average antler width from Area 17/28 was 45.0 inches (max=46.6 inches) and average from Area 18 was 33.8 inches (max=41 inches). In 2015, average antler width from Area 17/28 was 45.2 inches (max=59 inches) and average from Area 18 was 41.8 inches (max=45.5 inches).

Secondary objectives for the Jackson Herd Unit are to, 1) maintain a 5-year running average of at least 40% of male harvest ≥ 5 years of age, and 2) maintain a 3-year median age of ≥ 4.5 years old for harvested moose. The first of the secondary objectives is currently not being met (Fig. 1). The average percent male harvest ≥ 5 years of age from 2012-2016 was 38.5% (n = 31 samples). The second of the secondary objectives is currently being met (Fig. 2). The 3-year median age for harvested moose is 4.5 years (n = 20 samples) for 2014-2016. In general, managers would like to see the average age of harvested moose increase in the herd unit.

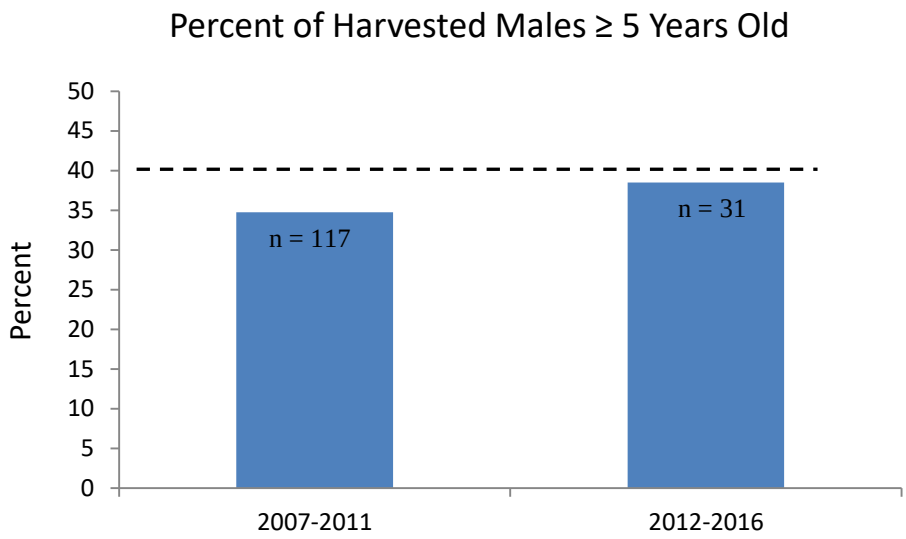


Fig. 1. Average percent of harvested males in the Jackson Herd Unit over 5 years old, in 5-year periods from 2007-2016. The dashed line indicates the objective of ≥ 40%.

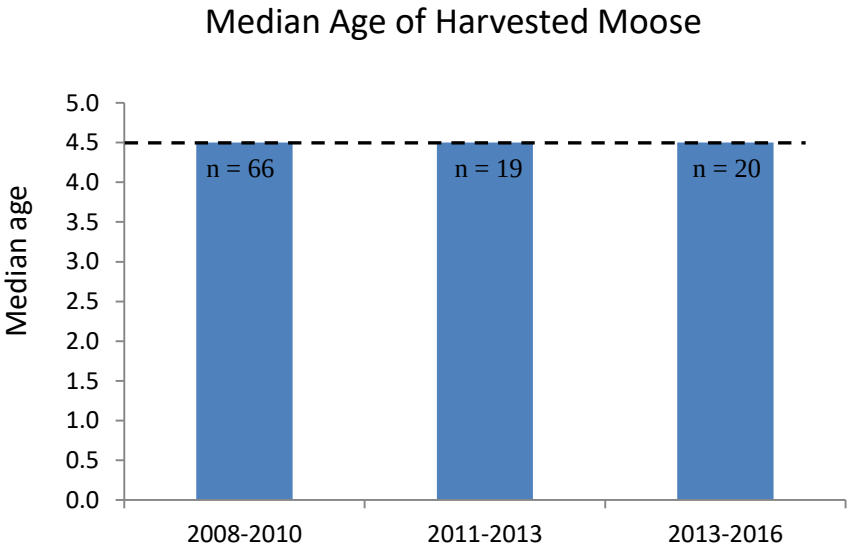


Fig. 2. Median ages of harvested moose in the Jackson Herd Unit, in 3-year periods from 2008-2016. The dashed line indicates the objective of ≥ 4.5 years.

Population

Past POP II model simulations likely overestimated moose numbers in the Jackson population. Spreadsheet models developed for this herd also do not appear to adequately simulate observed trends. Based on the sightability of marked animals during recent research projects it is likely there are fewer than 500 animals in this population. Although the population remains low, aerial survey data from recent postseason classifications indicate a high number of bull moose and an

improving calf:cow ratio. However, the low number of cows in the population suggests that any present or future recovery will be slow.

Management Summary

To offset observed population declines, antlerless moose hunting was eliminated in the Teton Wilderness in 2001 and in the Gros Ventre drainage in 2004. Antlered moose hunting seasons were closed in the Teton Wilderness in 2011 (Areas 7, 14, 15 and 32), and Areas 17 and 28 were combined into one unit beginning in the 2012 season. Despite these changes the moose population north of Jackson has not recovered. Although calf:cow ratios have improved in recent years, overall numbers of moose remain low. Even with current calf:cow ratios, any population recovery will be slow due to the low numbers of cow moose.

Conservative hunting seasons are again planned for 2017 with 10 licenses offered for the Gros Ventre drainage. The herd will continue to be closely monitored in future years to evaluate whether additional hunting opportunities can be provided. The high bull:cow ratios indicate that some harvest is sustainable at this time and complete closure to moose hunting in the Jackson Herd is not warranted for 2017.

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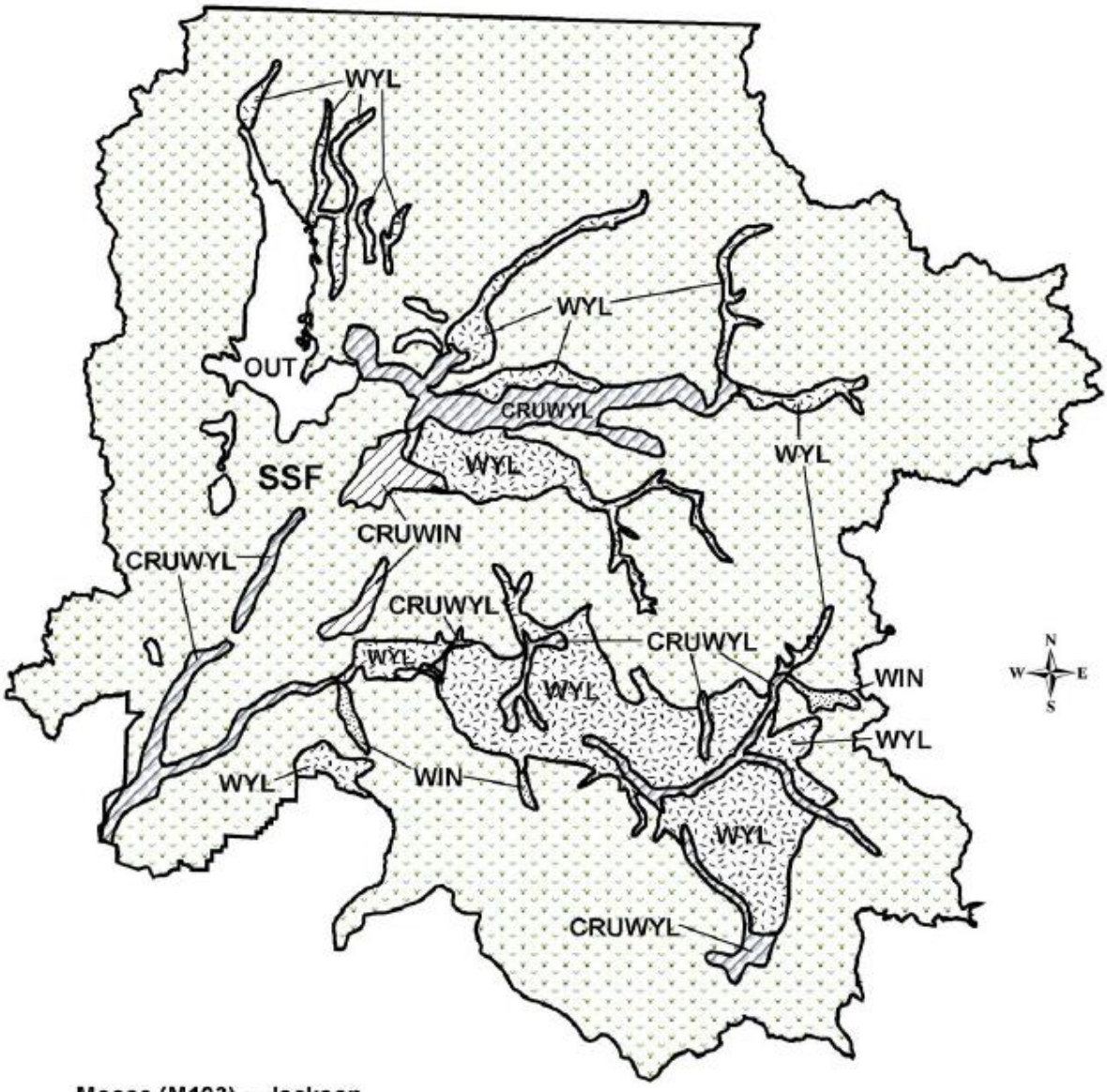

Moose (M103) -- Jackson
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