

IDAHO DEPARTMENT OF FISH AND GAME

Virgil Moore, Director

Surveys and Inventories

FY2017 Statewide Report



MOOSE

July 1, 2016 to June 30, 2017

Prepared by:

Wayne Wakkinen, Barb Moore Panhandle Region
Clay Hickey Clearwater Region
Daryl Meints Magic Valley Region
Zach Lockyer Southeast Region
Curtis Hendricks, Duston Cureton Upper Snake Region
Greg Painter, Bret Stansberry Salmon Region
Summer Crea Data Coordinator
David Smith Grants/Contracts Specialist

Compiled and edited by: Jon Rachael, Wildlife Game Manager

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STATEWIDE REPORT SURVEYS AND INVENTORY

JOB TITLE: Moose Surveys and Inventories

STUDY NAME: Big Game Population Status, Trends, Use, and Associated Habitat Studies

PERIOD COVERED: July 1, 2016 to June 30, 2017

STATEWIDE

Moose have expanded their range and numbers in parts of Idaho over the past few decades, moving westward into Washington and northeastern Oregon. Harvest records, field staff and hunter reports indicate however, that many moose populations in Idaho are stable or declining. A variety of reasons are being investigated to identify the causes. Also, across the state moose tag allocations have been reduced in response to reduced success rate, reduced antler size, and reduced numbers of animals seen by hunters. Interestingly, moose range has increased in some areas of the state that were previously thought to be less optimal habitat, but at the same time numbers have declined in parts of the state that used to be considered optimal moose habitat. Statewide harvest has declined about 20% since the peak in the mid 2000's.

More than 10,000 moose hunters that harvested moose between 1990 and 2012 were asked via letter to provide a sample of moose hair from their tanned hides or heads. More than 1400 samples were returned of which 936 were of adequate quantity and quality to be analyzed for mineral content. These taxidermy samples were compared with raw hair samples harvested in 2014 to determine if the tanning process changed mineral content. Samples were determined to be stable and comparable and thus provided a picture of the change in mineral levels of harvested moose across the state over time. Mineral levels varied across the state and over time and may have reflected changes in habitat conditions and soil mineral content. Hair can be used to determine mineral levels consumed over the course of the hair growth period and tanning does not seem to significantly alter hair composition of these minerals measured. A report is in progress.

Moose continue to be one of Idaho's most desirable trophy species among resident hunters. Hunters may harvest only 1 antlered and 1 antlerless moose in their lifetime (except for those tags left over after the initial drawing, which do not apply to the lifetime limit). A total of 5,296 first-choice applications were received for the 714 tags available for antlered moose in the fall 2016 hunting season, yielding overall drawing success of 14%. No antlered tags were available after the first drawing. Most applicants for antlered moose tags were resident Idahoans (4,583 or 87% of the total); only 713 non-residents applied despite non-residents being able to draw up to 10% of the total number of tags offered.

Of the 814 applicants for 159 antlerless moose tags, 806 (99%) were from residents. No antlerless tags were available after the first drawing.

For the 2016 season, 714 tag holders reported harvesting a total of 550 antlered moose (not including 3 antlerless males) (Table 1). The average antler spread of harvested moose was 37.3 inches, based on animals measured during the mandatory check conducted at Regional Offices, taxidermists, and contracted checkpoints around the state. Based on completed hunter harvest reports, success was over 80% for antlered moose harvest statewide.

In addition, 112 antlerless moose (including 3 antlerless males) were harvested by the 159 tag holders in fall 2016 (Table 1). The hunter success rate for antlerless moose was 70%.

Four additional tags were issued in conjunction with the Department’s “Super Hunt” drawings. Three antlered moose (75%) were reported harvested, in GMUs 8, 54, and 75. These 3 moose had an average antler spread of 37.5 inches.

Table 1. Statewide Moose hunter participation and harvest between July 1, 2016 and June 30, 2017.

Year	Hunters	Hunter Days	Total Harvest	Males	Females	% Change in Total Harvest from Previous Year
2017 ^a	873	5,047	662 ^a	554	108	

^a Includes Super Hunt tags

Table 2. Statewide Moose population surveys between July 1, 2016 and June 30, 2017.

Season	Females captured, radio-marked, and/or Monitored	Males captured, radio-marked, and/or Monitored	Calves captured, radio-marked, and/or Monitored	GMUs Surveyed
2017	0	0	0	2

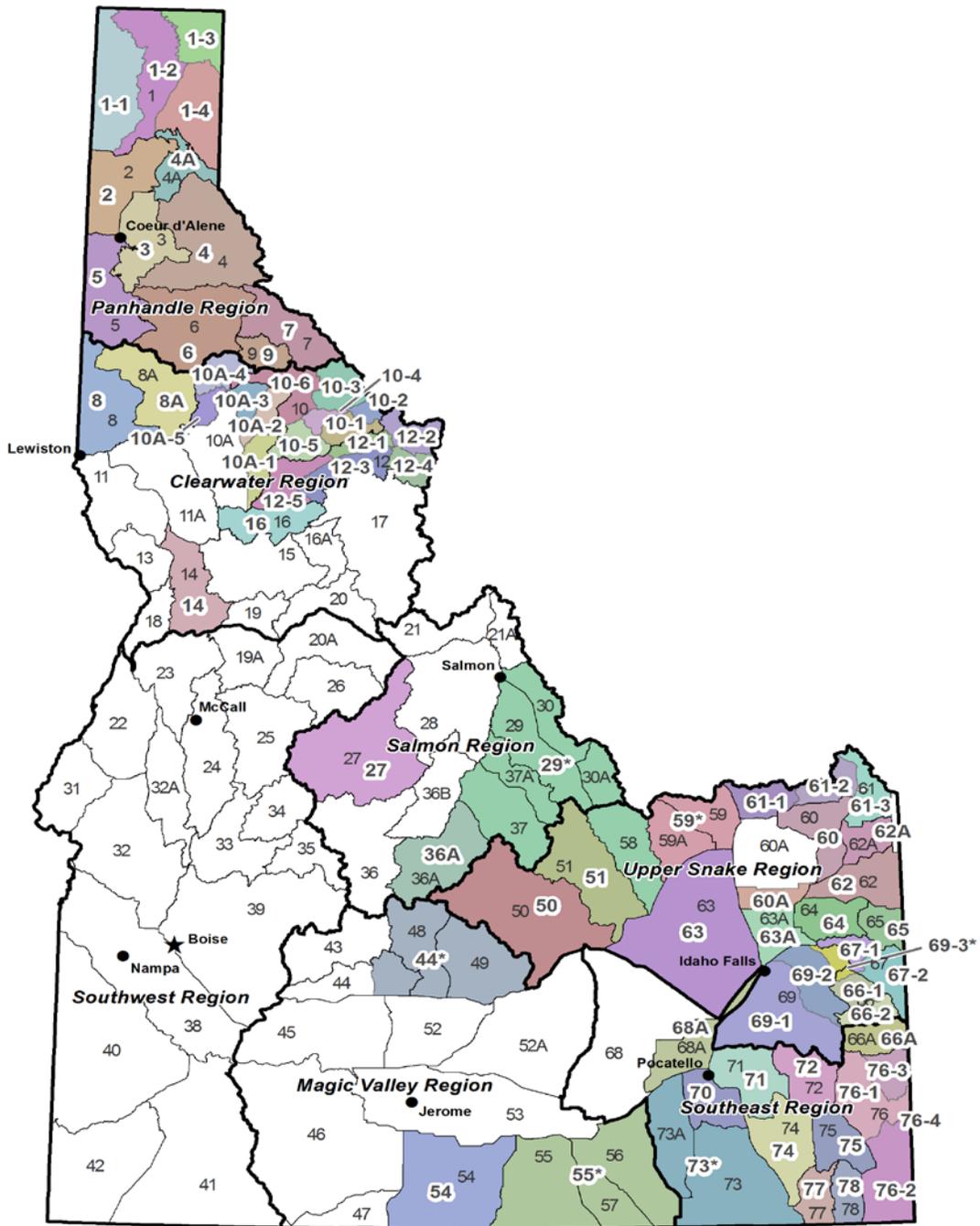


Figure 1. Statewide moose Controlled Hunt Areas.

PANHANDLE REGION

GMUs 1, 2, 3, 4, 4A, 5, 6, 7, 9

Controlled Hunt Areas 1-1, 1-2, 1-3, 1-4, 2, 3, 4, 4A, 5, 6, 7, 9

Abstract

The Panhandle Region offered 385 tags during the 2016 season. This represents a 35% increase in the number of tags offered ten years ago. Overall drawing odds for moose tags in the region was 15.1% during the 2016 season, consistent with the previous 10 years and substantially better than prior odds. During 2016, 5 of the 260 harvested bulls for which we have antler spread measurements were at least 50 inches in width (1.9%). The average spread for harvested antlered moose in 2016 was 36.6 inches (n=260). Success rates averaged 83% from 2007-2015 and dropped to 78% during the 2016 season.

Management Direction

1. Develop an index to moose population trends that does not rely solely on aerial surveys.
2. Place enforcement emphasis on known problem areas of illegal moose kills. Publicize moose poaching arrests and the statewide reward system (Citizens Against Poaching) in the media.
3. Develop a program for warning deer and elk hunters that moose are in an area to reduce accidental kills of moose.
4. Examine present Controlled Hunt boundaries and permit levels and adjust as necessary to provide quality hunts and distribute moose hunters more evenly. Coordinate moose management and tag levels along the Idaho/Washington border with the Washington Department of Fish and Wildlife.
5. Continue collecting information on moose distribution and mortality from Department and other agency personnel and the hunting public.

Background

Open areas and extensive riparian areas that typify moose habitat elsewhere are not widespread in the Panhandle Region. Moose in this region often utilize closed-canopy timber stands with interspersed shrub fields and creek bottoms. Presently, moose populations appear to be fairly stable in most Hunt Areas of the Panhandle (Figures 2 & 3).

Historically, moose have been managed in Idaho for long hunts with high success rates and a good opportunity to harvest a large-antlered bull. This conservative approach, coupled with a high demand for moose hunting, led to poor odds for drawing a moose tag. In response, short, 7-day hunts were initiated during the fall of 2005 to; a) provide hunters a choice for better drawing odds at the expense of season length and; b) provide data on how success rates change with a short season. Further modifications to the moose hunting season structure were initiated for the 2007 and 2008 seasons. The 86-day hunts in Game Management Units (GMUs) 1 and 2 were eliminated and replaced with a series of 14-day hunts.

Starting with the 2009-2010 seasons, both long and short hunts were offered. Long seasons (77 days) offered more opportunity but lower drawing odds while short hunts resulted in better drawing odds. Hunters applying for the short hunts were over twice as likely to successfully draw a tag (Table 4).

Population Surveys

In December of 2010, an aerial helicopter survey was flown in the northern part of GMU 5, including the Mica Peak area from the Spokane River south to Windy Bay. In 18 search GMUs, 68 total moose were observed (23 bulls, 26 cows, 15 calves, 4 un-classified). The moose sightability data were run through several models. Quayle et al. (2001) developed a sightability model for moose in south-central British Columbia, which estimated the Mica Peak population to be 72. Anderson and Lindzey's (1996) sightability model developed for moose in Wyoming estimated the total to be 82 moose. The Hiller sightability model, developed for elk, produced an estimate of 100 moose. The Bell helicopter model, developed for elk, estimated the total number of moose in the Mica Peak area to be 115.

An aerial thermal infrared survey was conducted by Vision Air Research, Boise, ID at the end of March in the same section of GMU 5. Transects were flown 800 ft. apart at 1,500 ft. above ground in a fixed wing aircraft. An infrared sensor was mounted on the wing of the aircraft and operated by a wildlife biologist. Moose were located by observing their level of emitted infrared energy versus background levels. A total of 112 moose were observed. Some moose may have been missed if they were obscured by vegetation.

The infrared survey technique yielded an estimate for the number of moose that fell within the range of the elk sightability model estimates. Thermal infrared surveys should be further explored as a way to estimate moose populations.

Harvest Characteristics

Moose hunting was authorized in all Panhandle GMUs for the first time in 2007 (Table 2). In 2007, 5 antlered moose tags each were issued in GMU 4A and GMU 5. The Department issued 385 moose tags for the 2016 season: 195 tags for antlered moose with a 77-day season (15 Sept – 1 Dec), 140 tags for antlered moose with 2 different 14-day seasons (1 Oct – 14 Oct; 1 Nov – 14 Nov), and 50 tags for antlerless moose with a 48-day season (15 Oct – 1 Dec).

Hunters reported harvesting 303 moose with the 385 available tags for an overall success rate of 78% (Table 1). This is slightly lower than the average success rate of 83% over the past 8 years of moose harvest throughout the Panhandle. Success rates in individual GMUs varied from 60% to 100%, but small sample sizes in some of these GMUs make success rates volatile.

Of the 260 antlered moose for which we have antler spread measurements, 5 were equal to or exceeded 50 inches (1.9%) in 2016. This is similar to previous data for the previous 6 years and is as follows: 2015: 0.8%, 2014: 1.2%, 2013: 4.2%, 2012: 3.1% 2011: 2.0%, and 2010: 2.8%, .

Controlled Hunt Odds

Most areas of Idaho have tags available for a variety of big game species. By forcing a choice between moose and other big game tags, the Department has been successful in substantially improving drawing odds across most of the state. Moose hunting is a once in a lifetime draw and statewide the drawing odds are about 12% - similar to the Panhandle in 2016 (15.1%) with Hunt Areas ranging from a low of 9% to a high of 20% (Table 1).

In a further attempt to address the complaint of hunters that it was too difficult to draw a moose tag, the Department conducted a trial 7-day hunt for 2005 and 2006 to provide an avenue for improving drawing odds. It was believed that relatively few hunters would opt for the shorter season, thus greatly improving drawing odds for those hunters who were interested in choosing better drawing odds at the expense of a shorter hunting season. It was also believed that success rates would diminish slightly with the shorter season, allowing the moose herd to support additional tags to be issued, which would further improve drawing odds.

Over the past 29 years, the number of moose applicants in the Panhandle Region has steadily risen, but the number of tags being offered has increased at a faster rate, resulting in significantly better drawing odds (Table 1, Figures 3 & 4). Further, antlered moose hunts with short seasons had much better drawing odds than longer seasons (Table 3).

Another modification of the shorter hunts was offered in 2007-2008. A series of 6 14-day hunts were offered in GMUs 1 and 2 with the first hunt starting on 30 August and the last hunt starting on 15 November. This was another attempt to provide hunter opportunity and improve drawing odds. Drawing odds were significantly better for these 14-day hunts as compared to the traditional 86-day hunts, however, hunters were disappointed that no long hunt was offered in these GMUs.

Starting with the 2009-2010 season, both long and short hunts were offered in most Panhandle GMUs. Drawing odds were better for the shorter hunts (Table 3) and hunters seemed happy that they had the choice of the long or short hunts.

Management Implications

An attempt was made beginning in 2001 to become less conservative in many of our moose hunts, particularly in Hunt Areas 1-1, 1-3, and 2. The overall drawing odds have improved to the point that an applicant now has a 15.1% chance of drawing a moose tag in the Panhandle Region. Hunt areas range from as low as 9.2% to a high of 20.3% (Table 2). Success rates have remained relatively high and the mean antler spread has remained stable across years. Average antler spread for moose for which we have measurements (in inches) across the last 5 years is as follows: 2016: 36.6, 2015: 36.3, 2014: 35.9, 2013: 37.1, and 2012: 37.5.

The lack of moose population surveys is a serious handicap to moose management in Idaho. For the most part, tag levels continue to be set conservatively, based on field observation, public input, and the perception of what is socially acceptable. This conservative approach has produced poor drawing odds, the major complaint regarding moose management in Idaho, although recent changes in the Panhandle Region have improved the situation. However, the

lack of surveys makes it difficult to determine the impact of the significant changes that have been made to the Panhandle seasons. Therefore combining information gathered by other state agencies and field observations is one way to adjust tag levels. Anecdotal information and low hunting success suggest that moose population within the northern panhandle GMUs are decreasing.

Drawing odds were much better for the 14-day hunts than the 77-day hunts, providing an avenue for hunters willing to trade season length for improved odds (Table 4). Hunters with the shorter hunts reported high satisfaction with the hunts during animal check-ins. It was hypothesized that the success rates for the shorter hunts would be lower than the longer hunts, allowing more hunters afield. The difference, however, was relatively minor. The success rates during the different time periods of these short hunts will be used to evaluate the practicality of continuing to offer these hunts and the possibility of adjusting tag levels based on success rates.

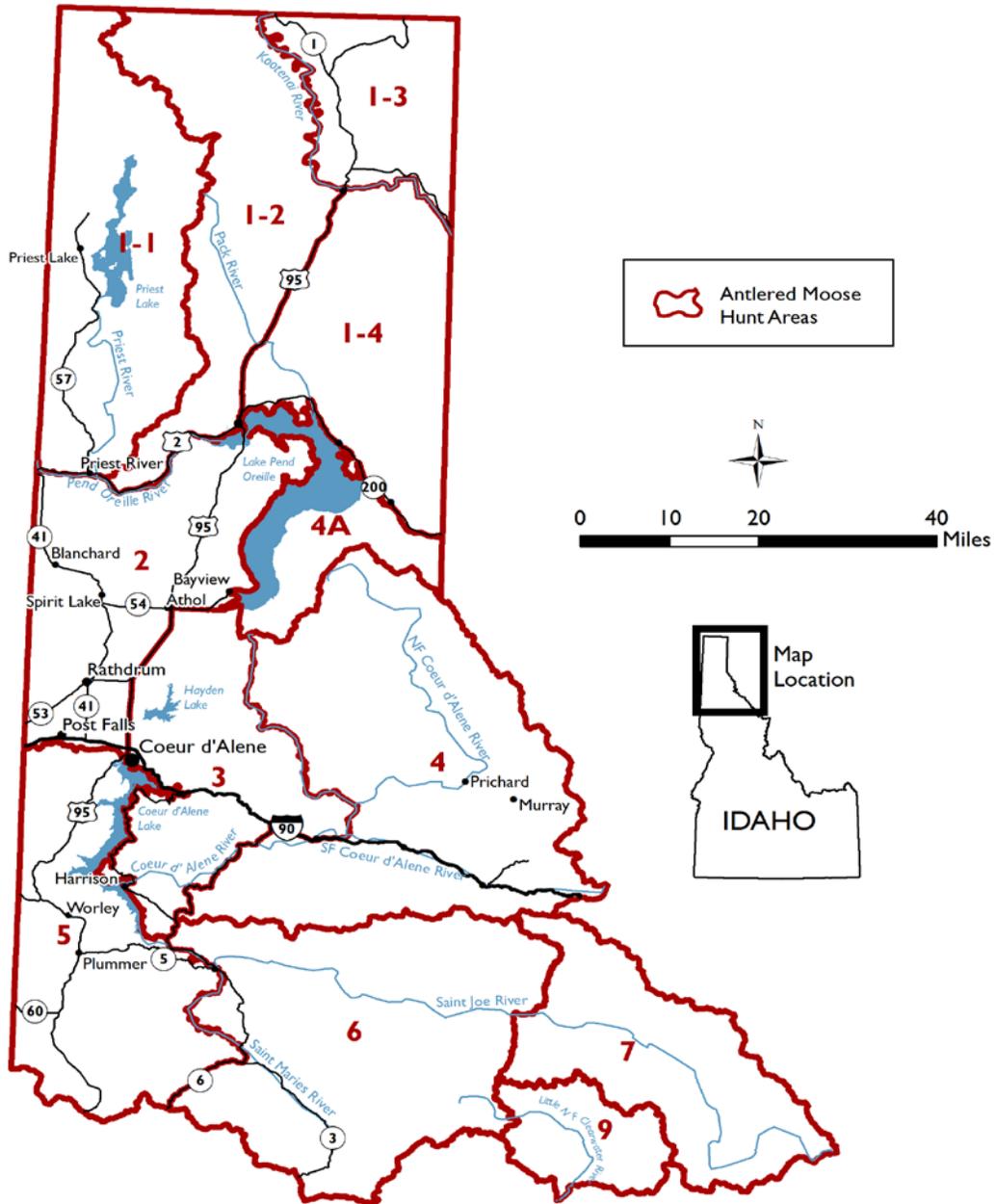


Figure 2. Panhandle Antlered Moose Hunt Areas.

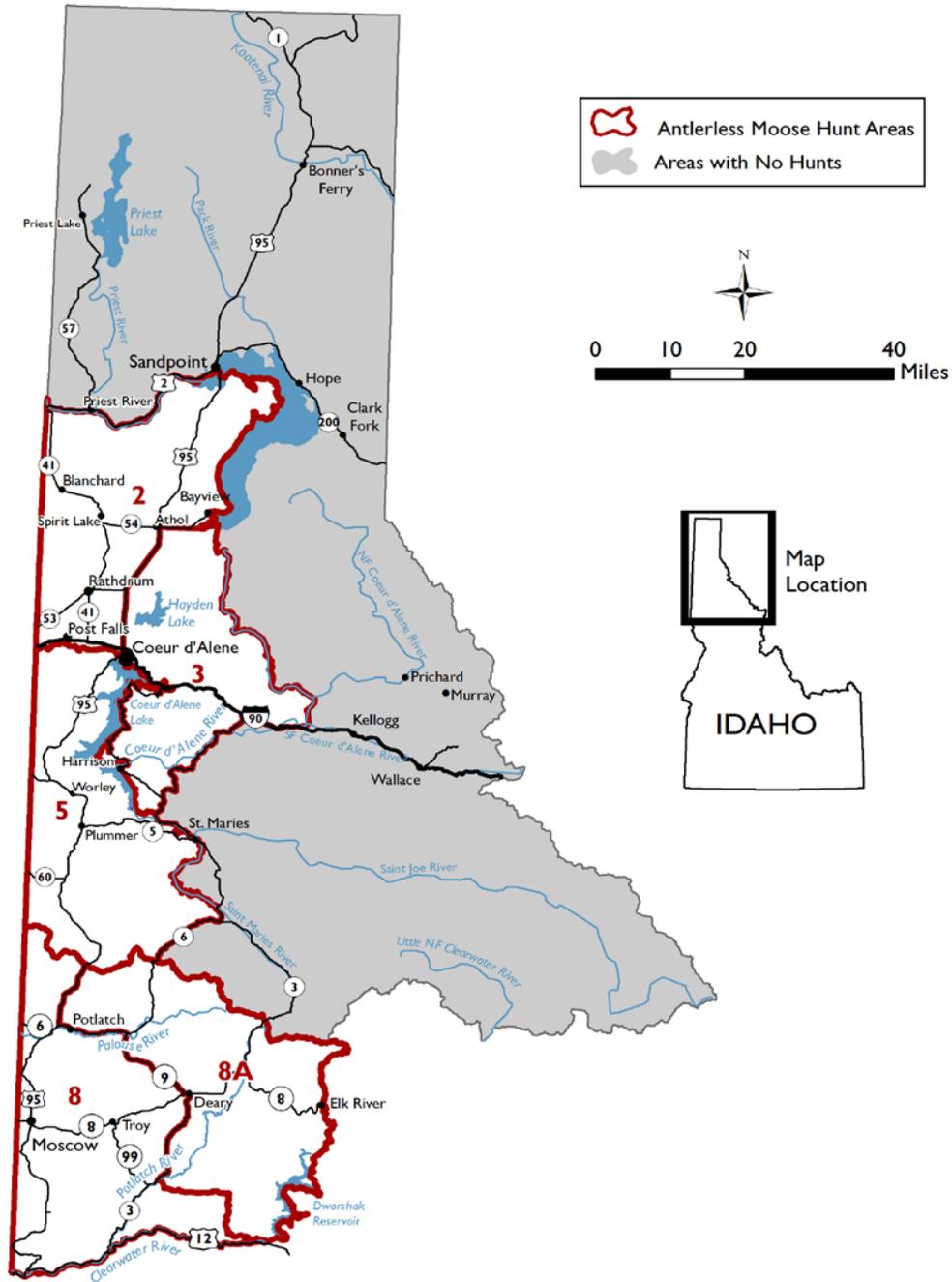


Figure 3. Panhandle and Clearwater Antlerless Moose Hunt Areas.

Table 1. Moose harvest and overall drawing odds, Panhandle Region, 2006-present.

Year	Tags	Harvest			Hunter success (%)	First-choice applicants	Drawing Odds %
		M	F	Total			
2006	285	215	22	237	83	2,878	9.9
2007	352	251	32	283	80	2,443	14.4
2008	352	235	36	271	77	2,352	15.0
2009	386	298	48	346	90	2,763	14.0
2010	386	283	50	333	86	2,814	13.7
2011	388	277	46	323	83	3,136	12.4
2012	373 ^a	263	42	305	85	2,880	13.0
2013	367 ^b	272	43	315	86	3,148	11.5
2014	366 ^b	262 ^b	40	302	83	2,964	12.3
2015	388 ^b	258 ^b	41	299	77	2,927	13.3
2016	388 ^b	264 ^b	39	303	78	2,549	15.1

^a No tags (15) were sold in hunt numbers 3009 and 3095 in 2012.

^b Includes Super Hunt tag.

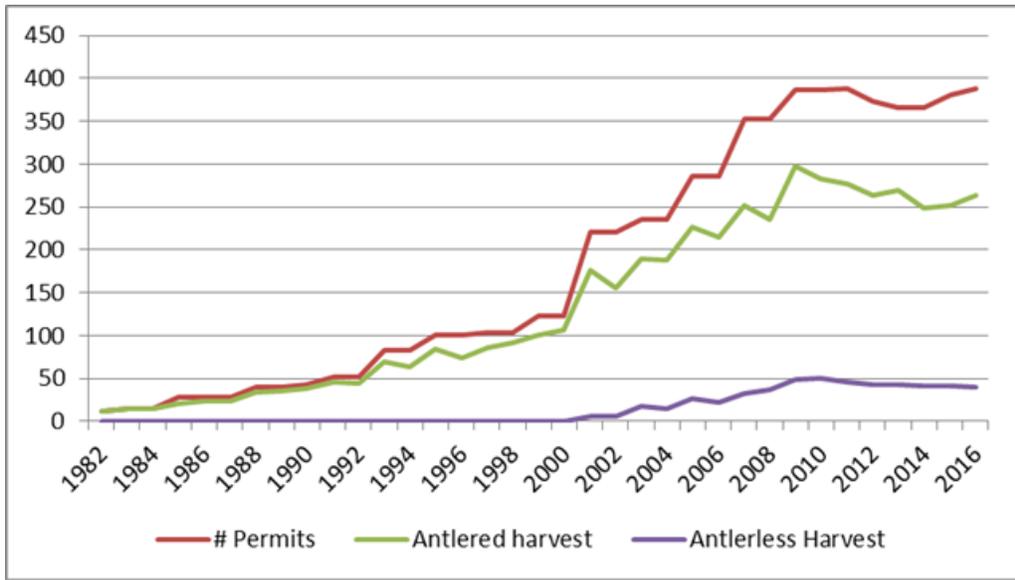


Figure 4. Total number of tags, antlered harvest, and antlerless harvest, Panhandle Region, 1981-2015.

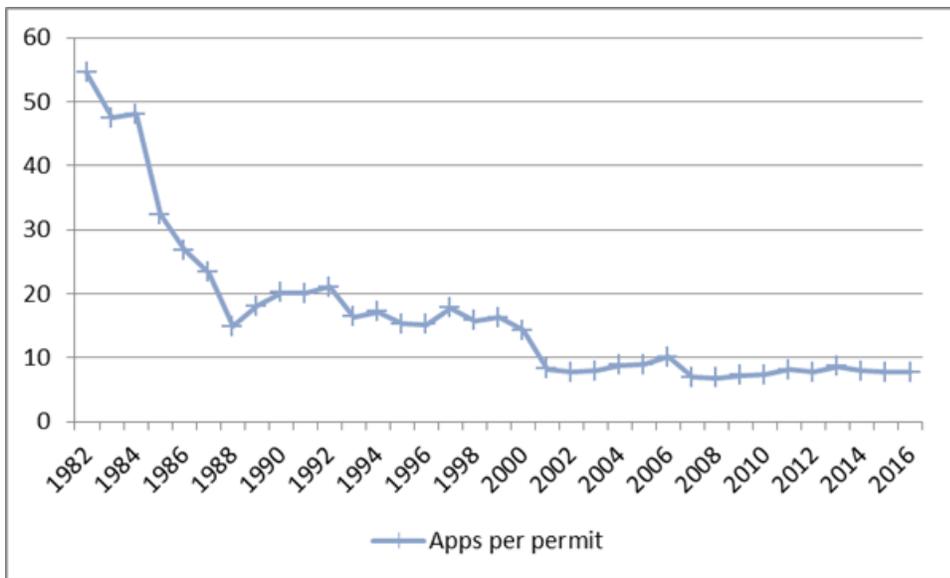


Figure 5. Number of applicants per tag, Panhandle Region, 1981-2015.

Table 2. Moose harvest and drawing odds by GMU, Panhandle Region, 2006-present.

GMU	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing Odds (%)
			M	F				
1	2007	218	147	17	75	8.7	1,053	20.7
	2008	219 ^b	136 ^b	18	71	5.6	917	23.8
	2009	207 ^b	160 ^b	15	85	7.0	1,112	18.5
	2010	206	154	20	84	5.7	1,071	19.2
	2011	180	131	7	77	7.9	1,056	17.0
	2012 ^a	165 ^b	119	1	79	8.1	809	20.4
	2013	142 ^b	108 ^b	0	77	9.2	929	15.3
	2014	143 ^{b,c}	109 ^{b,c}	0	76	9.2	845	16.6
	2015	146 ^{b,c}	87 ^{b,c}	0	60	8.7	850	16.5
	2016	144 ^{b,c}	91 ^{b,c}	0	63	9.7	706	19.8
2	2007	44	25	15	91	6.9	334	13.2
	2008	44	22	18	91	2.8	496	8.9
	2009	65	35	28	97	5.6	526	12.4
	2010	65	31	25	86	7.5	506	12.8
	2011	75	39	29	91	4.8	673	11.1
	2012	75	36	33	92	4.4	746	10.1
	2013	91 ^b	50 ^b	34	92	3.7	872	10.4
	2014	92 ^{b,c}	46 ^{b,c}	31	84	6.45	790	8.7
	2015	91 ^c	49 ^c	32	90	5.2	719	12.5
	2016	90	48	31	88	5.0	623	14.4
3	2007	20	19	0	95	7.2	122	16.4
	2008	20	18	0	90	5.9	165	12.1
	2009	30	24	5	97	5.6	192	15.6
	2010	30	20	5	83	6.2	227	13.2
	2011	33	25	4	88	5.2	230	14.3
	2012	33	26	4	94	5.0	259	12.7
	2013	35	24	4	80	8.3	221	15.8
	2014	35	24	5	83	7.6	234	15.0
	2015	35	21	5	74	7.6	207	16.9
	2016	35	22	3	71	6.6	172	20.3
4	2007	20	20	0	100	8.2	333	6.0
	2008	20	19	0	95	4.4	364	5.5
	2009	25	22	0	88	9.7	358	7.0
	2010	25	25	0	100	5.0	398	6.3
	2011	30	28	0	93	7.0	471	6.4
	2012	30	28	0	93	6.9	386	7.8
	2013	30	29	0	97	6.3	430	7.0
	2014	30	30	0	100	6.9	415	7.2
	2015	35	30	0	86	7.4	410	8.5
	2016	35	32	0	91	6.9	352	9.9
4A	2008	5	2	0	40	12.5	24	20.8
	2009	5	4	0	80	3.0	8	62.5
	2010	5	4	0	80	3.0	17	29.4
	2011	5	2	0	40	12.5	13	38.5
	2012	5	2	0	40	16.5	14	35.7
	2013	5	4	0	80	6.7	13	38.5
	2014	5	3	0	60	7.3	25	20.0

Table 2 Continued

GMU	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing Odds (%)
			M	F				
5	2015	5	3	0	60	8.3	18	27.8
	2016	5	3	0	60	17.0	19	26.3
	2008	5	4	0	80	9.3	149	3.4
	2009	11 ^b	11 ^b	0	100	6.8	175	5.7
	2010	10	10	0	100	11.9	193	5.2
	2011	20	12	5	85	5.9	217	9.2
	2012	20	14	4	90	5.3	249	8.0
	2013	20	15	5	100	9.8	272	7.4
	2014	20	12	3	75	9.9	220	9.1
	2015	30	24	4	93	6.7	313	11.2
2016	30	24	5	97	10.0	199	15.0	
6	2007	20	20	0	100	7.2	292	6.8
	2008	21 ^b	20 ^b	0	100	5.8	338	5.9
	2009	26 ^b	26 ^b	0	100	6.7	294	8.5
	2010	25	24	0	96	7.1	280	8.9
	2011	25	23	0	92	6.1	321	7.8
	2012	25	23	0	92	6.6	289	8.7
	2013	25	26	0	100	6.0	318	7.9
	2014	25	23	0	92	8.1	319	7.8
	2015	30	27	0	87	7.2	286	10.5
	2016	30	29	0	97	7.6	326	9.2
7	2007	10	9	0	90	6.9	70	14.3
	2008	10	5	0	50	6.8	68	14.7
	2009	10	9	0	90	4.4	36	27.8
	2010	10	8	0	80	4.9	68	14.7
	2011	10	8	0	80	6.0	51	19.6
	2012	10	7	0	70	4.0	51	19.6
	2013	10	6	0	60	8.6	50	20.0
	2014	11 ^c	8	0	80	5.1	48	16.7
	2015	10	8	0	80	7.5	82	12.2
	2016	10	9	0	90	7.9	78	12.8
9	2007	10	9	0	90	6.9	56	17.9
	2008	10	9	0	90	6.4	78	12.8
	2009	10	9	0	90	4.1	62	16.1
	2010	10	10	0	100	4.9	54	18.5
	2011	10	8	0	80	5.3	56	17.9
	2012	10	8	0	80	4.2	48	20.8
	2013	10	10	0	100	2.0	43	23.3
	2014	10	8	0	80	1.6	68	14.7
	2015	10	9	0	90	3.4	65	15.4
	2016	10	10	0	100	5.6	74	13.5

^a No tags (15) were sold in hunt numbers 3009 and 3095 in 2012.

^b Includes Super Hunt.

^c Includes rainchecks.

Table 3. Comparison of moose harvest success rates and mean antler spread with 77-day and 14-day seasons, Panhandle Region, 2014 and 2015.

Season	Season length	Season Dates	Tags issued	Number harvest ^a	Success rate ^a (%)	Mean antler spread ^b
2016	77 days	15 Sep-1 Dec	190	136	72	36.1
	14 days	1 Oct-14 Oct	65	56	86	36.0
	14 days	1 Nov-14 Nov	75	60	80	33.5

^a Hunter harvest success.

^b Does not include bulls with 0.0 spreads

Table 4. Drawing odds by hunt type and season length for moose, Panhandle Region, 2006-present.

Year	Hunt type	Season length (days)	Tags	Drawing Odds (%)
2007	Antlered	86	50	18.5
	Antlered	14	262	4.8
	Antlerless	40	40	6.7
2008	Antlered	86	50	18.3
	Antlered	14	262	4.6
	Antlerless	40	40	6.2
2009	Antlered	77	210	9.4
	Antlered	14	121	3.3
	Antlerless	49	55	7.3
2010	Antlered	77	210	9.2
	Antlered	14	121	4.0
	Antlerless	49	55	7.3
2011	Antlered	77	205	10.5
	Antlered	14	128	4.0
	Antlerless	48	55	9.2
2012	Antlered	77	195	9.7
	Antlered	14	118	4.7
	Antlerless	48	45	7.7
2013	Antlered	77	185	8.7
	Antlered	14	130	4.8
	Antlerless	48	50	9.1
2014	Antlered	77	185	9.2
	Antlered	14	150	23.6
	Antlerless	48	50	12.0
2015	Antlered	77	195	11.9
	Antlered	14	140	15.4
	Antlerless	48	50	14.0
2016	Antlered	77	195	13.5
	Antlered	14	140	17.9
	Antlerless	48	50	15.4

CLEARWATER REGION

GMUs 8, 8A, 10, 10A, 12, 14, 16

**Controlled Hunt Areas 8, 8A, 10-1, 10-2, 10-3, 10-4, 10-5, 10-6,
10A-1, 10A-2, 10A-3, 10A-4, 10A-5, 12-1, 12-2, 12-3, 12-4, 12-5, 16**

Abstract

Mandatory harvest report data indicated that Clearwater Region hunters harvested 59 antlered moose in 20 antlered-only Controlled Hunts and an additional 8 antlerless moose in 2 Controlled Hunts during 2016. One additional bull moose was harvested in Hunt Area 8 on a Super Hunt tag. A total of 107 tags (94 antlered, 12 antlerless, and 1 Super Hunt) were valid across the region and resulted in a total harvest success rate of 64% in 2016. Antlered and antlerless success rates were 63% and 67%, respectively. The mean antler spread for the 60 antlered moose harvested in the region was 37.9 inches. These harvest and hunter success rates were similar to those observed in recent years.

Moose have declined precipitously in some portions of the Clearwater Region (southern) over the past 15-20 years. Reasons for these declines are poorly understood, but have also been documented elsewhere in other Northwestern states, as well as the great Lakes states and in the Northeastern/New England states. Idaho has been participating in a collaborative research effort with neighboring states to investigate possible causes for these declines. Correspondingly, permits offered in the Clearwater Region have declined as well. The 106 moose permits currently offered represents a 63% reduction from the high of 290 permits offered in 2001.

Management Direction

- Moose populations will be allowed to increase in GMUs where habitat and other conditions will support expansion.
- Legal harvest will continue to be focused on antlered bulls. Antlerless moose hunting opportunities will be continued in those areas where population control measures are considered desirable.
- Moose harvest will be adjusted where necessary to reflect changes in hunter success rates and antler spread.
- Known mortalities will be documented and information on antler size, effort, distribution and other data will be obtained from big game mandatory harvest checks.

Moose populations large enough to support hunts are currently found in GMUs 8, 8A, 10A, 10, 12, 14, and 16. Game Management Units are divided into Controlled Hunts to disperse hunters and to direct harvest to specific areas (Figures 6 & 7). Reconfiguration of Hunt Areas and closure of several GMUs took effect for the 2013 and 2014 moose hunting seasons to address chronically low populations and poor hunt quality.

Historically, moose were hunted through Controlled Hunts for antlered animals only; however, in 1999, 2 antlerless moose hunts (Hunts 8-2 and 8A-2 with 4 tags each) were initiated to

increase hunting opportunity, address increasing moose densities, and minimize the potential for moose-automobile collisions and other conflicts in these areas. Hunting seasons for moose in the Clearwater Region again ran 86 days for antlered moose hunts and 40 days for antlerless hunts in 2016 (Appendix A). Since 1986, persons applying for moose tags have been prohibited from applying for any other Controlled Hunt to improve drawing odds. Additionally, unsuccessful tag holders must wait 2 years before applying for another controlled moose hunt. Tag levels are based on trends in antler spread of harvested moose and hunter success rates of recent tag holders in the respective Controlled Hunts.

Some moose populations in the Clearwater Region are found in climax vegetative cover. Summer feeding habits tend to be nocturnal in open, wet meadows, while diurnal activity is limited to adjacent forested areas. Logging may improve foraging and reduce thermal habitat for these populations. Winter habitat selection favors young subalpine fir and Pacific yew plant communities. Other populations are adapted to early seral plant communities, except in winter. These populations may be expanding in areas where extensive habitat manipulation has resulted in seral brush fields that are between 10 and 20 years of age. Winter ranges appear to be timbered areas where yew-wood thickets are several hundred years old. Creating openings in these timber stands through logging may impact moose by eliminating these yew-wood thickets. Effects of the recent expansion of wolves on moose populations within the region are as yet largely undetermined. Disease, parasite, and nutritional data are also being evaluated across the state and southern distribution range of moose in North America.

Population Surveys

Moose in the Clearwater Region are usually counted incidental to elk surveys. Consequently, many moose are not counted because these surveys are seldom flown at elevations where many moose normally winter and because moose tend to prefer dense subalpine fir plant associations for winter habitat where they are less visible. As a result, no comparative population data have been collected on a regular basis on moose throughout the region.

A sightability survey of moose in GMU 15 was attempted in 2000. Results were unsatisfactory because of overly large confidence intervals. These results were due to the extreme correction factors applied to animals detected under heavy canopy coverage classes.

Harvest Characteristics

Several changes have been made to regional moose Hunt Areas in recent years. Hunt Areas in GMUs 12, 15, and 17 were combined and/or renamed in 2001 and 1 new Hunt Area was added in GMU 10 (10-6) in 2001. Tag numbers were adjusted in the region to respond to changes in hunter success rates and/or antler spread with a net loss of 22 tags in 2001 (from 290 to 270) and a further reduction of 20 tags in 2005 (250). For the 2009 and 2010 seasons, the total number of tags was reduced from 250 (242 antlered and 8 antlerless) to 169 (161 antlered and 8 antlerless). A large portion of this reduction came about as result of a reconfiguration (elimination of numerous small hunts into one GMU-wide hunt with reduced tag levels in GMUs 16A, 17, 19 and 20). Antlered-only tags were further reduced in 2011 from 161 to 145 as result of combining the 4 hunts (with 24 tags) in GMU 15 into 1 GMU-wide hunt with 8 tags. Additional permit reductions were implemented prior to the 2013-2014 moose hunting seasons due to poor

population performance (Hunt Areas not meeting management criteria of $\geq 75\%$ hunter success, $\geq 35"$ antler spread). Tags were reduced from 153 total tags available in 2012 to 106 in 2013 (94 antlered, 12 antlerless). Hunt Areas 12-3 and 12-4 were combined and available tags were reduced to 2. Hunt Areas 14-1 and 14-2 were combined and available tags were reduced to 5. Hunt Areas 16-1 and 16-2 were combined and available tags were reduced to 2. Moose hunts were closed in GMUs 15, 16A, 17, 19, and 20. An additional 2 tags were added to each of the antlerless moose hunts in Hunt Areas 8 and 8A.

Harvest levels, hunter success, and hunter days are determined from mandatory harvest reports (Tables 1 & 2). Clearwater region hunters harvested 59 antlered moose from 20 antlered-only controlled hunts and an additional 8 antlerless moose in 2 antlerless-only controlled hunts in 2016. One additional bull moose was harvested in Hunt Area 8 on a Super Hunt permit. A total of 107 tags (94 antlered, 12 antlerless, and 1 Super Hunt) were available across the region and resulted in a reported harvest of 68 total moose for an overall success rate of 64%. Success rates for 2016 antlered and antlerless moose were 63% and 67%, respectively. The mean antler spread for the 60 antlered moose harvested in the region was 37.9 inches.

Reported moose mortalities due to methods other than legal harvest during Controlled Hunts have varied considerably by year (Table 3). It is likely that the level of mortality is considerably higher than what is reported.

Management Implications

Tag levels will continue to be allocated based on trends in antler spread of harvested moose and hunter success rates of recent tag holders. Numbers of tags may be increased or decreased as dictated by harvest data. Tag numbers have been adjusted in the region to respond to changes in hunter success rates and/or antler spread with a net loss of 184 tags since 2001 (from 290 to 106).

As evidenced by the tag reductions described above, moose have been declining in portions of the Clearwater region over the past 15-20 years. Declines have been most pronounced in the southern portion of the region. Reasons for these declines are poorly understood, but have also been documented along the southern distribution range of moose across North America (Great Lakes states, Northeast/New England states, and elsewhere in the Pacific Northwest). Idaho is currently part of a research collaborative that also includes Wyoming, Montana and Washington to investigate potential causes of these declines in the Northwest.

Idaho conducted a graduate research project (Schrempp 2017) to evaluate moose forage quantity and quality in northern Idaho, as part of this multi-state effort. Field sampling was conducted 1) to identify summer diet, 2) to evaluate the nutritional content of Forage species, 3) to predict current and past availability of these forage species, 4) to evaluate selection of forage species in relation to their availability and quality, and 5) to look for evidence that summer forage might be limiting to declining populations. Forage species that were both moderate to high quality and highly available were most commonly consumed and comprised the bulk of individual diets. Statistically significant correlations were found between harvest-based indices of population performance parameters at the GMU scale, which suggests that forage quantity and quality are

impacting moose population performance at some level. Further research linking forage with nutrition and fitness of individuals is needed to quantify how forage might be influencing populations.

A preliminary result from other on-going research being conducted elsewhere has identified a wide range of possible factors potentially contributing to these observed declines. Some of these include climate change related shifts in plant phenology (forage quantity and quality) and changing parasite prevalence and impacts on moose. In addition, impacts of predation (especially wolf-related) are being evaluated (although some moose populations have declined in areas devoid of wolves).

The effects of the recent expansion of wolves across Idaho and the Region on moose populations are as yet largely undetermined. In 2008, the region began monitoring moose in GMU 10 that were captured and radio-collared to determine mortality rates and causes of death in the presence of wolves. This work was done in conjunction with a wolf-elk interaction research project in the Lolo Zone. Unfortunately, sample sizes of radio-marked moose never reached desired levels. Results of this work were summarized in previous years' reports. In summary, wolves were not a significant cause of mortality on adult moose. However, calf mortality was high (6 of 12 radio-marked animals) in the only year that calves were collared (2011).

Literature Cited

Schrempp, T.V. 2017. Diet Selection, Forage Quality, and Forage Availability: Could Forage Limit Moose Populations in Northern Idaho? MS thesis, University of Idaho.

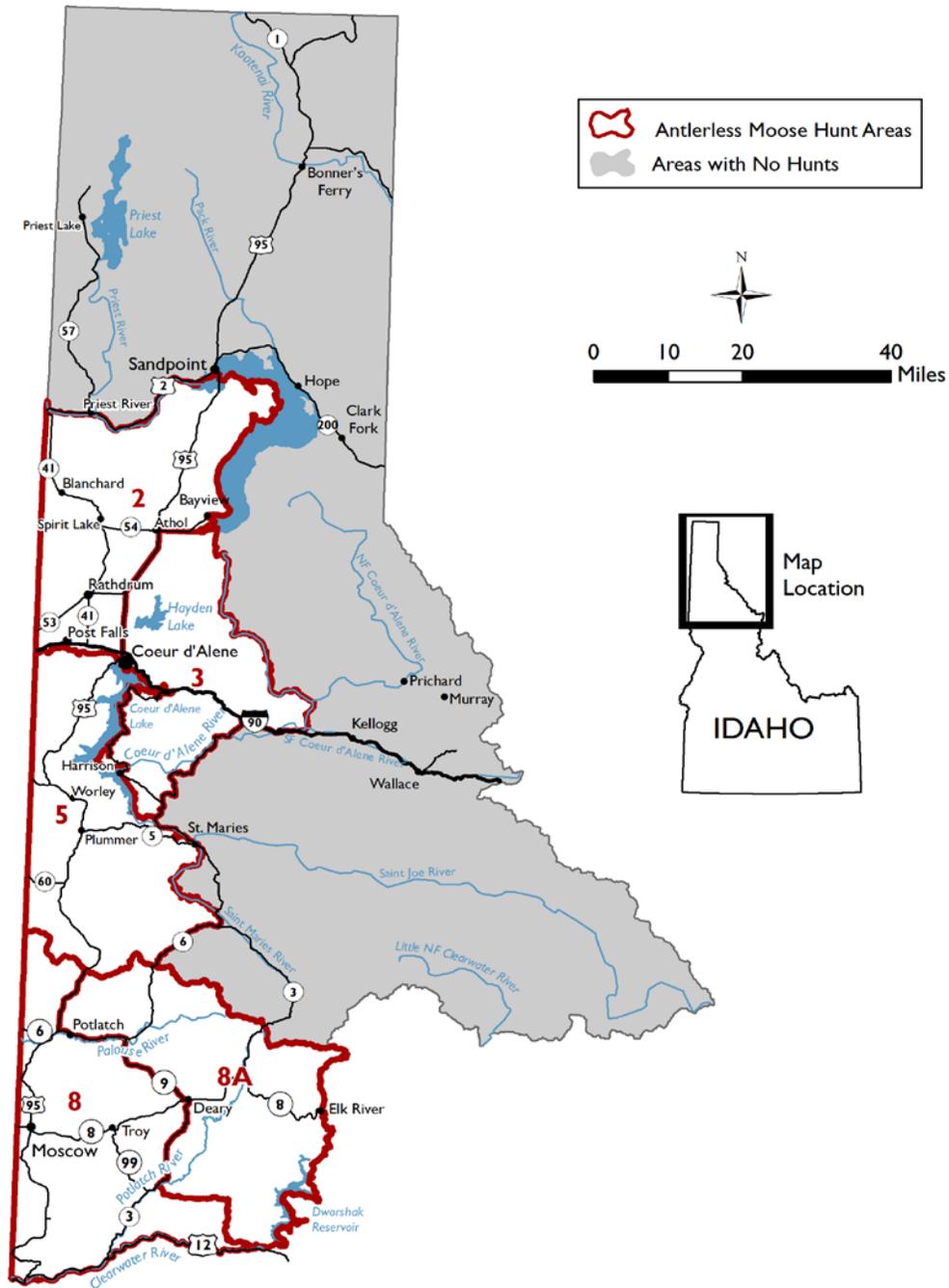


Figure 7. Panhandle and Clearwater Antlerless Moose Hunt Areas.

Table 1. Moose harvest and drawing odds, Clearwater Region, 2006-present.

Year	Tags	Harvest			Hunter success (%)	First-choice applicants	Drawing odds (%)
		M	F	Total			
2006	250	144	7	151	60	943	26.5
2007	250	130	7	137	55	938	26.7
2008	250	117	8	125	50	850	29.4
2009	169	79	6	85	50	788	21.4
2010	169	79	8	87	51	801	21.1
2011	156	71	7	78	51	625	25.0
2012	147 ^a	64	6	70	48	644	22.8
2013	108 ^{b,c}	60	11	71	66	730	14.8
2014	107 ^c	62 ^c	8	70	65	631	16.8
2015	107 ^c	58 ^c	8	66	62	694	15.3
2016	107 ^c	60	8	68	64	715	14.8

^a 153 tags were issued in 2012, although 6 hunters elected to take rain checks (wildfire related) and did not participate in the hunt.

^b 106 tags were issued to include 4 rain check holders from 2012.

^c Includes Super Hunt tag(s).

Table 2. Moose harvest and drawing odds by GMU, Clearwater Region, 2006-present.

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter ^a	First-choice applicants	Drawing odds (%)
			M	F				
8	2007	12	7	4	92	6.5	98	12.2
	2008	12	7	4	92	3.1	112	10.7
	2009	12	7	4	92	5.3	123	9.8
	2010	12	7	4	92	3.0	164	7.3
	2011	12	8	4	100	7.9	144	8.3
	2012	12	7	3	83	4.3	144	8.3
	2013	18 ^d	12	6	100	9.0	207	8.7
	2014	16	9	5	88	7.8	167	9.6
	2015	17 ^d	10 ^d	5	88	10.7	130	12.3
	2016	17 ^d	10 ^d	6	94	11.4	135	11.8
8A	2007	12	8	3	92	7.7	169	7.1
	2008	12	8	4	100	6.5	181	6.6
	2009	12	8	2	83	7.9	201	6.0
	2010	12	8	4	100	7.5	223	5.4
	2011	12	8	3	92	5.5	171	7.0
	2012	12	8	3	92	10.4	218	5.5
	2013	16	11	5	100	8.1	268	6.0
	2014	17 ^d	10 ^d	3	76	7.2	197	8.1
	2015	16	10	3	81	11.6	223	7.2
	2016	16	11	2	81	9.0	222	7.2
10	2007	32	25	0	78	5.7	113	28.3
	2008	32	17	0	53	6.6	106	30.2
	2009	32	22	0	69	9.2	120	26.7
	2010	32	19	0	59	5.8	97	33.0
	2011	32	13	0	41	6.2	77	41.6
	2012	32	14	0	44	2.7	48	66.7
	2013	27	9	0	33	7.9	67	40.3
	2014	27	12	0	44	8.1	64	42.2
	2015	27	10	0	37	9.1	92	29.3
	2016	27	12	0	44	8.4	101	26.7
10A	2007	34	31	0	91	11.8	191	17.8
	2008	34	24	0	71	9.0	192	17.7
	2009	29	20	0	69	13.9	168	17.3
	2010	29	20	0	69	6.1	152	19.1
	2011	29	19	0	66	8.2	131	22.1
	2012	29	16	0	55	5.4	115	25.2
	2013	24	17	0	71	10.9	121	19.8
	2014	24	19	0	79	11.0	126	19.0
	2015	24	16	0	67	6.4	125	19.2
	2016	24	17	0	71	10.4	160	15.0
12	2007	43	18	0	42	9.0	73	58.9
	2008	43	21	0	49	10.6	64	67.2

Table 2. Continued.

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter ^a	First-choice applicants	Drawing odds (%)
			M	F				
	2009	26	9	0	35	5.9	42	61.9
	2010	26	15	0	58	11.1	48	54.2
	2011	26	10	0	38	5.9	27	96.3
	2012	26	13	0	50	3.2	44	59.1
	2013	16	5	0	31	18.0	41	39.0
	2014	16	8	0	50	8.6	30	53.3
	2015	16	9	0	50	6.3	61	26.2
	2016	16	8	0	50	11.4	58	27.5
14	2007	13	8	0	62	6.5	71	18.3
	2008	13	6	0	46	8.0	83	15.7
	2009	11	6	0	56	9.2	42	26.2
	2010	11	5	0	45	4.4	55	20.0
	2011	11	6	0	56	12.8	33	33.3
	2012	7 ^d	2	0	29	0.5	37	16.1
	2013	6	6	0	100	12.3	20	30.0
	2014	5	2	0	40	3.0	42	11.9
	2015	5	3	0	60	15.3	29	17.2
	2016	5	1	0	20	12.0	30	16.0
15 ^c	2006	45	25	0	55	12.4	143	31.5
	2007	45	20	0	44	11.1	117	38.5
	2008	45	18	0	40	11.0	108	41.7
	2009	24	3	0	13	6.0	70	34.3
	2010	24	4	0	17	25.8	46	52.2
	2011	8	2	0	25	12.0	27	29.6
	2012	8	1	0	13	0.3	13	61.5
16	2007	12	9	0	75	8.2	38	31.6
	2008	12	3	0	25	12.7	38	31.6
	2009	4	2	0	50	6.5	7	57.1
	2010	4	1	0	25	ND	7	57.1
	2011	4	2	0	50	6.8	5	80.0
	2012	4	0	0	0	ND	4	100.0
	2013	2	0	0	0	ND	6	33.3
	2014	2	0	0	0	ND	5	40.0
	2015	2	0	0	0	ND	4	50.0
	2016	2	1	0	50	9.0	9	22.0
16A ^c	2006	7	4	0	57	10.7	9	77.8
	2007	7	1	0	14	30.0	18	38.9
	2008	7	3	0	43	4.5	6	100.0
	2009	4	0	0	0	ND	2	100.0
	2010	4	0	0	0	ND	4	100.0
	2011	4	1	0	25	40.0	1	100.0
	2012	4	1	0	25	1.8	1	100.0

Table 2. Continued.

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter ^a	First-choice applicants	Drawing odds (%)
			M	F				
17 ^c	2006	18	6	0	33	6.5	13	100.0
	2007	18	0	0	0	ND	18	100.0
	2008	18	5	0	28	8.5	17	100.0
	2009	5	1	0	20	15.0	7	71.4
	2010	5	1	0	20	1.0	2	100.0
	2011	5	1	0	20	1.0	1	100.0
	2012	5	0	0	0	ND	1	100.0
19 ^c	2006	12	8	0	66	4.9	19	63.2
	2007	12	0	0	0	ND	19	63.2
	2008	12	3	0	25	6.7	7	100.0
	2009	5	1	0	20	5.0	3	100.0
	2010	5	1	0	20	2.0	1	100.0
	2011	5	0	0	0	ND	7	71.4
	2012	5	0	0	0	ND	9	55.6
20 ^c	2006	10	2	0	20	12.0	12	83.3
	2007	10	3	0	30	4.0	11	90.9
	2008	10	2	0	20	15.0	6	100.0
	2009	5	0	0	0	ND	3	100.0
	2010	5	0	0	0	ND	2	100.0
	2011	5	1	0	0	14.0	1	100.0
	2012	3 ^b	1	0	33	1.0	1	100.0

^a Data from successful hunters only.

^b 5 tags issued but 2 hunters elected to take rain checks (fire-related) and did not hunt

^c Hunts no longer offered after 2012.

^d Includes Super Hunt tag(s).

Table 3. Known moose mortalities, excluding Controlled Hunts, Clearwater Region, 2004-present.

Year	Mortality agent					Total
	Native American harvest	Illegal kill	Road kill	Natural	Other	
2004	0	7	2	2	1	12
2005	2	7	6	2	0	17
2006	0	2	0	2	1	5
2007	1	2	1	0	1	5
2008	0	1	3	0	1	5
2009	1	2	3	0	0	6
2010	0	2	2	1	0	5
2011	0	0	2	1	1	4
2012	0	0	0	3	1	4
2013	0	0	1	0	0	1
2014	0	0	4	2	1	7
2015	0	2	2	0	0	4
2016	0	0	2	0	1	3

MAGIC VALLEY REGION

GMUs 44, 48, 49, 55, 56, 57

Controlled Hunt Areas 44 and 55

Abstract

Moose populations have declined in the northern portion of the Magic Valley Region and increased in the southern portion. Because of this, for the 2011 and 2012 seasons, antlerless harvest was eliminated and antlered tags reduced in GMUs 44, 48 and 49 (CH area 44). Hunts were authorized for the first time in GMUs 55 and 57 (CH area 55) in 2011 and in GMU 54 in 2015.

A new hunt was opened in GMU 54 starting in 2015. In 2016, 9 antlered tags were issued in Hunt Areas 44, 54 and 55, 8 hunters were successful. In addition, 3 Super Tag holders and 1 Director's Office tag holder also took moose in GMU 54.

Management Direction

Follow statewide management direction; allow established populations to expand; transplant moose where feasible; and increase effort to record sightings and mortalities.

Background

Prior to 1990, transient moose were recorded throughout the Magic Valley Region, but there were no viable, resident populations. From 1986-2000, 31 moose were released in GMUs 43 and 44. Following these releases, moose numbers in the region continued to increase as a result of good reproduction and natural ingress. Presently, viable populations capable of sustaining limited harvest occur in GMUs 44, 48, 49, 54, 55, 56, and 57 (Figure 8).

Population Surveys

Aerial population surveys for moose have not been conducted in the region. During the 1990s and 2000s, increasing anecdotal observations indicated a growing moose population along the South Fork Boise River in GMU 43, Willow Creek in GMU 44, Big Wood River in GMU 48, and in the Trail Creek drainage on the border of GMUs 48-49. However, over the past few years, observations and harvest rates have declined. Populations in the Sublett area (GMU 56) appear to be stable and observations are common. In recent years, most have continued to expand their distribution and have become increasingly common in GMUs 54, 55, and 57.

Harvest Characteristics

Hunting season length for antlered moose in the 3 Hunt Areas in Magic Valley Region was 86 days in 2016 (Appendix A). Three antlered tags were offered in Hunt Area 44. The boundary of Hunt Area 44 was changed prior to the 2005 hunting season to include portions of GMUs 44 and 48. The boundary was again changed prior to the 2011 hunting season to include a portion of GMU 44 and all of GMUs 48 and 49. As a result, Hunt Area 48 was eliminated in 2011. Of the 2 bulls harvested in Hunt Area 44 in 2016, 1 was taken in GMU 48 and 1 in 44 (Table 1).

Prior to 2011, Hunt Area 56 included GMUs 56, 73, and 73A. However, in 2011, because of growing moose populations in GMUs 55 and 57, GMU 56 was combined with those two GMUs into a new Hunt Area 55. Five antlered tags were offered in Hunt Area 55. Five bulls were harvested, four in GMU 55 and 1 in GMU 57.

One antlered tag was offered in GMU 54 and the tag was filled. In addition, 3 Super Tag holders and one Director's Office tag holder also took bull moose in GMU 54.

No antlerless hunts were offered in the Magic Valley region during 2016.

Capture and Translocation

Six moose were captured and translocated in the region during this reporting period.

Management Implications

Moose population declines in the Big Wood River drainage and surrounding areas have resulted in the elimination of antlerless hunts and a reduction in antlered tags in Hunt Area 44 since the 2011 and 2012 seasons. Although no formal population surveys are planned, the population will continue to be monitored through incidental observations by agency personnel and the public.

Increasing moose numbers in the southern portion of the region (GMUs 54, 55, and 57) have provided the opportunity to expand hunting opportunities. GMUs 55 and 57 were opened to moose hunting for the first time in 2011 and were grouped with GMU 56 into Hunt Area 55. Moose hunting was offered for the first time in GMU 54 in 2015.

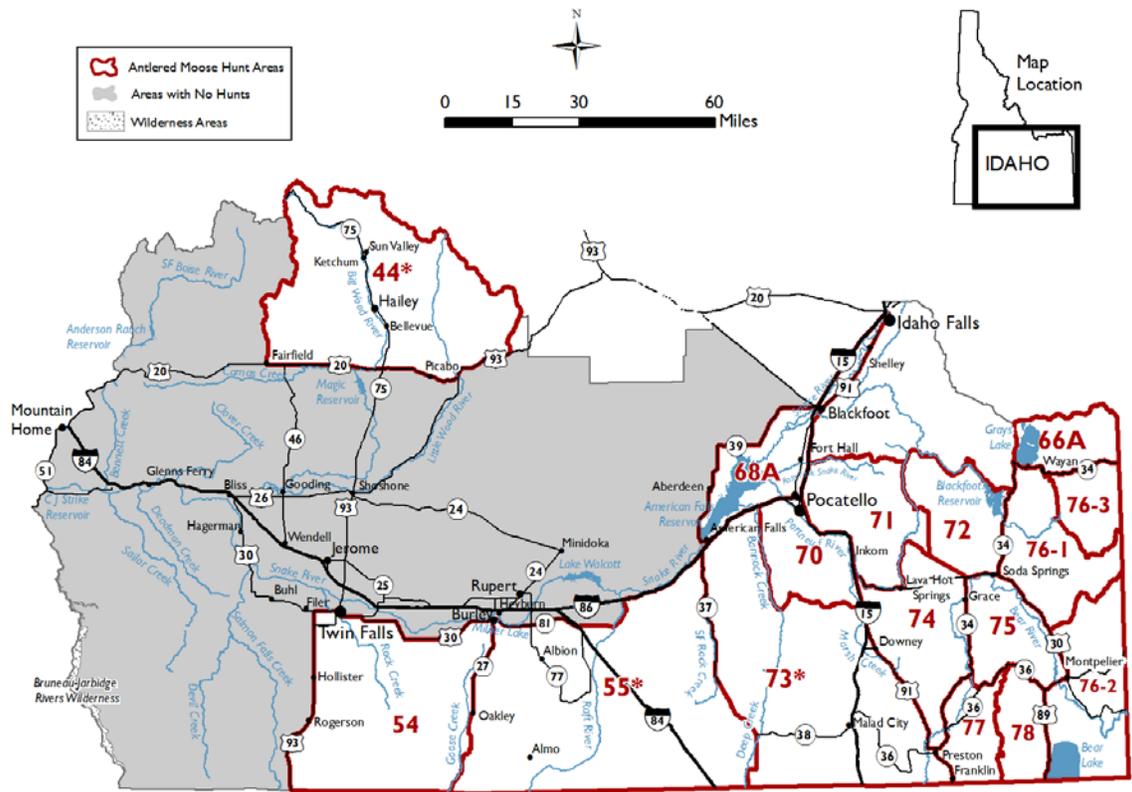


Figure 8. Magic Valley and Southeast Antlered Moose Hunt Areas.

Table 1. Moose harvest and drawing odds by Hunt Area, Magic Valley Region, 2006-present.

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
44 ^a	2007	6	3	1	67	3.5	10	60.0
	2008	6	1	1	33	5.0	23	26.1
	2009	6	1	1	33	19.5	18	33.3
	2010	6	1	0	17	5.0	11	54.5
	2011	3	2	0	67	4.5	17	17.6
	2012	3	3	0	100	5.0	11	27.3
	2013	3	3	0	100	17.3	16	18.8
	2014	3	3	0	100	8.0	35	8.6
	2015	3	3	0	100	4.7	28	10.7
	2016	3	2	0	67	2.0	27	11.1
48 ^b	2005	4	2	2	100	6.3	8	50.0
	2006	4	1	2	75	4.5	9	44.4
	2007	4	0	0	0	0	6	66.7
	2008	4	2	0	50	12.0	8	50.0
	2009	4	2	2	100	4.5	11	36.4
	2010	4	2	0	50	8.0	9	44.4
54	2015	1	1	0	100	2.0	106	0.9
	2016	1	1	0	100	2.0	36	2.7
55	2011	5	5	0	100	7.0	138	3.6
	2012	5	5	0	100	2.4	97	5.2
	2013	5	5	0	100	9.2	139	3.6
	2014	5	3	0	60	11.3	129	3.9
	2015	5	5	0	100	9.3	115	4.3
	2016	5	5	0	100	9.3	114	4.4
56 ^c	2003	5	5	0	100	17.2	37	13.5
	2004	5	5	0	100	5.6	44	11.4
	2005	5	5	0	100	12.3	46	10.9
	2006	5	5	0	100	4.5	42	11.9
	2007	5	5	0	100	7.8	73	6.8
	2008	5	3	0	60	10.0	114	4.4
	2009	5	5	0	100	4.0	116	4.3
	2010	5	5	5	100	6.8	111	4.5

^a Hunt established in 2001; includes portions of GMUs 44 and 48.

^b Hunt established in 2005, ended 2010; includes all of GMU 49 and a portion of GMU 48.

^c Prior to 2011 Hunt Area included GMUs 56, 73, and 73A. In 2011 and 2012 Hunt Area 55 was established and included GMUs 55, 56 and 57, closing Hunt Area 56.

SOUTHEAST REGION

GMUs 66A, 68A, 70, 71, 72, 73, 73A, 74, 75, 76, 77, 78

**Controlled Hunt Areas 66A, 68A, 70, 71, 72, 73,
74, 75, 76-1, 76-2, 76-3, 76-4, 77, 78**

Abstract

Eighty-one antlered-only and 42 antlerless-only tags were offered in 2016 (this is the same as the 2015 harvest season) and 57 antlered (70.3% hunter success) and 22 antlerless (52.4% harvest success) moose were harvested. This is a slight decrease from 2015 when 61 antlered (75.3% hunter success) and 27 antlerless (64.3% hunter success) moose were harvested. The average outside antler spread was 38.1 inches in 2016, which is very similar to the 37.1 inch average from 2015 (for antlered moose for which data are available; Tables 2 & 3).

Management Direction

Management direction for moose in Southeast Region follows that for the state in general: to provide “high-quality” hunting and other moose-related recreational opportunities. Consequently, tag levels are conservative, and hunter success is high relative to hunts for other cervid species. For antlered-only hunts, emphasis is on providing each hunter with the opportunity to harvest a mature bull moose. Antlerless-only moose hunting is also offered due to relatively high moose populations. Non-consumptive values of moose are also important.

The 1991-1995 Moose Management Plan established the goals of providing high-quality moose hunting and other moose-related recreational experiences for as many people as possible, assisting the expansion of moose populations into available habitat, and increasing tag numbers where possible.

Background

Prior to the 1950s, there were too few moose in Southeast Region to justify a harvest. The first hunt for moose in the region was held in 1959 when 5 antlered-only tags were issued for a portion of GMU 76. As moose populations continued to grow and expand to other areas in the Southeast Region so did the hunting opportunity and harvest, reaching a high of 180 moose harvested in 11 GMUs in 2003. Tag levels and total harvest have decreased significantly since 2003 in response to apparent changes in population densities. Illegal moose harvest may be substantial (Kuck and Ackerman 1984), although reporting of these cases is sporadic. The Department issued a small number of tags for any moose in several GMUs from 1975-1990. An average of 80% of that harvest was antlered moose. In 1991, antlerless-only hunts were instituted in GMUs 66A and 76. Since 1991, tags have been issued for antlered or antlerless-only moose (Figures 9 and 10). Antlerless moose hunts start later than antlered hunts to provide more time for calf development.

Population Surveys

No surveys were conducted specifically for moose in the Southeast Region during the reporting period. However, moose were counted incidentally during an elk survey in GMU’s 76 and 66A

in late winter 2013. A total of 122 moose were observed (52 bulls, 43 cows, 23 calves, 4 unknown) with a bull:cow:calf ratio of 121:100:54. Similarly, moose were counted during a mule deer survey of the Bannock PMU (GMUs 70, 71, 73, 73A, 74, 75, 77, 78) in 2015. A total of 282 moose were observed (67 bulls, 94 cows, 30 calves, and 91 unknown) with a bull:cow:calf ratio of 71:100:32. Lastly, in January 2017 we incidentally counted moose during the Bear River Elk survey (GMUs 75, 77, and 78). A total of 109 moose were observed (39 bulls, 45 cows, 14 calves, and 11 unknown) with a bull:cow:calf ratio of 87:100:31. Because these were not randomized aerial sightability surveys designed specifically for moose, caution must be taken interpreting the results as there is observability bias in the data; however, this information does provide some general baseline trend information for future comparison.

The most recent moose specific survey was conducted January 2002 in GMUs 66A and 76-3. In Hunt Area 66A, 19 search GMUs were stratified as high, medium, or low likelihood of moose and 13 search GMUs were flown for sightability. One hundred fifty-two moose were counted in these 13 search GMUs consisting of 75 cows, 48 bulls, and 29 calves (Table 1). Estimates of 219 (± 31) total moose including 105 (± 15) cows, 75 (± 18) bulls, and 39 (± 9) calves were generated using the Hiller-Soloy Wyoming-based model (Unsworth et al. 1994). Overall herd composition was estimated as 48% cows, 34% bulls, and 18% calves. The population estimate of 219 in 2002 was 23% lower than the estimate of 285 in 1995; however, 90% confidence intervals overlap. The average number of moose observed was 3.0 in low GMUs, 16.0 in medium GMUs, and 18.5 in high GMUs. Search GMUs were likely well-stratified for the survey.

During the 2002 survey, in Hunt Area 76-3, 13 search GMUs were stratified as high or low likelihood of moose and 10 search GMUs were flown for sightability. One hundred three moose were counted in these 10 search GMUs consisting of 41 cows, 48 bulls, and 14 calves (Table 1). Estimates of 174 (± 40) total moose including 71 (± 20) cows, 78 (± 20) bulls, and 25 (± 8) calves were generated using the Hiller-Soloy Wyoming-based model. Overall herd composition was estimated as 41% cows, 45% bulls, and 14% calves. The population estimate of 174 in 2002 was very close to the 167 estimated in 1995. The average number of moose observed was 9.8 in low GMUs and 11.2 in high GMUs. Search areas may need to be re-stratified or have stratification by moose likelihood deleted in future surveys.

Harvest Characteristics

Tag levels decreased from 130 total tags in 2014 to 123 total tags in 2015. Previously, GMU 76 had 3 antlerless hunts with 5 tags each (76-1, 76-2, and 76-3) and GMU 71 had 2 antlerless hunts with 5 tags each (71-1 and 71-2). However, reduced hunter success and concern regarding moose populations in those GMUs resulted in dissolving the separate smaller boundaries and issuing 10 antlerless tags for all of GMU 76 and 5 antlerless tags for all of GMU 71. This was a total reduction of 10 antlerless tags between those two GMUs. Similarly, hunter success rates and concern over moose populations in GMU 77 resulted in a reduction from 5 antlerless tags to 3 antlerless tags. Furthermore, GMU 71 was also changed for the antlered-only moose hunts where the previous split of that GMU into 2 hunts was dissolved to include all of GMU 71 with 6 total antlered-only tags (a net reduction of 4 antlered-only tags).

In contrast to these reductions, new moose opportunities were added in several GMUs. Antlerless-only tags were added to GMU 74 (2 tags), GMU 73 (3 tags), and GMU 68A (2 tags). Two antlered-only tags were also added to GMU 68A. The 4 total tags in GMU 68A (2 antlered-only and 2 antlerless) are archery-only hunts and the first time moose hunting has been permitted in this GMU.

In 2016, 123 total moose tags were offered in the southeastern region. Tag numbers and structure were the same as in 2015 in all southeast region GMUs because of the two year season setting cycle for trophy species.

Minimum harvest was available through a mandatory mortality report of successful hunters. Reported harvest was 57 antlered and 22 antlerless moose (compared to 61 antlered and 27 antlerless in 2015; Tables 2 and 3). Average antler spread for the Southeast Region was 38.1 inches (compared to 37.1 in 2015). Minimum overall hunter success rate for the region was 70.3 % for antlered-only tags and 52.4% for antlerless-only tags (compared to 75.3% for antlered tags and 64.3% for antlerless tags in 2015).

Other sources of moose mortality are Native American harvest, natural, road-kills, illegal, and other. For the 2016 reporting period, 3 non-harvest mortalities were reported (Table 4). Reporting of non-hunting mortalities is believed to be much lower than the actual number.

Climatic Conditions

Winter 2015-2016 snow depths averaged 80-100 % of the 30-year mean for most of the southeast region. This is similar to the past several years when we have experienced mild conditions. Spring conditions were mild with below average moisture levels extending into the summer months.

Habitat Conditions

Succession of aspen stands into conifer will negatively affect moose habitat in the future. Treatment to retard succession may slow potential decreases. Development and disturbance associated with mining and timber harvest in the eastern portion of the region continues to threaten moose habitats. Livestock grazing and other development of riparian areas negatively impacts moose habitat in many parts of the region.

Management Implications

The mandatory check of moose harvested provides the majority of information available for management. Aerial surveys, using sightability models such as Anderson (1994) and Unsworth et al. (1994), provided solid background data in 2002 and years prior, but limitations on resources has not allowed for repetition of these surveys since. Currently, the only population data obtained on moose is from incidental observations during mule deer and elk aerial surveys. As such, tag levels are set at conservative levels that likely allow for passive population expansion and growth, particularly in those areas being newly colonized.

The drawing odds for antlered-only tags indicate strong demand for moose hunting opportunity. Drawing odds varied considerably in 2016, with antlered draw odds varying between 4.5% and 21.7% and antlerless odds varying between 17.2% and 100%, depending on the hunt. These odds are quite similar to odds from 2015.

Moose also have high non-consumptive values for viewing by the public. Their relative abundance and general lack of fear of humans when in the open make them easy for people to observe.

Moose translocations and hazing activities are expanding to include the entire year rather than spring and early summer. Over the course of a year, on average, 5 – 30 moose wander into the city of Pocatello and surrounding communities. These are usually yearlings or 2-year olds and are most often hazed back into the surrounding hills or captured using chemical immobilization and translocated to more suitable habitat.

Moose population data may need to be collected again in the form of specific sightability surveys or incidentally during deer and elk surveys in the future. Wyoming is experiencing unexplained declines in moose populations directly to the east of the Southeast Region. Some possible explanations may be parasites, disease, climate change, predation, or alterations in moose habitat.

Literature Cited

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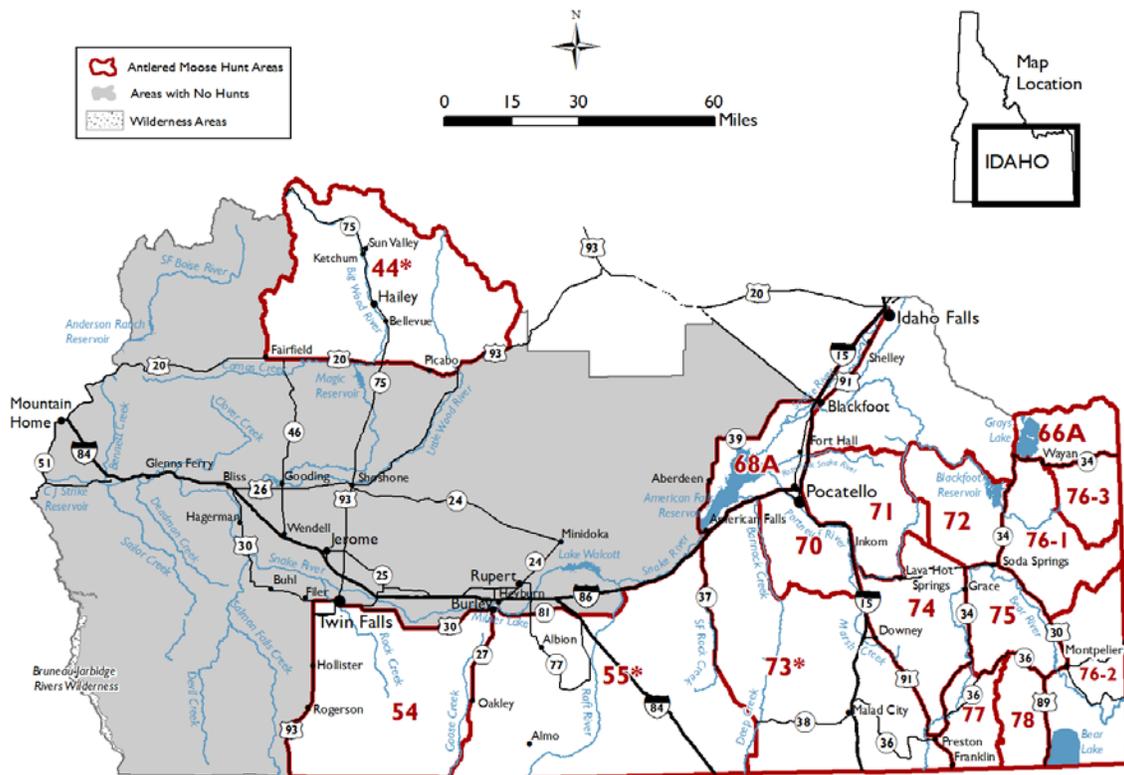


Figure 9. Southeast and Magic Valley Antlered Moose Hunt Areas. Hunt area 68A added for 2015 season.

Upper Snake & Southeast Region Antlerless Moose Hunts

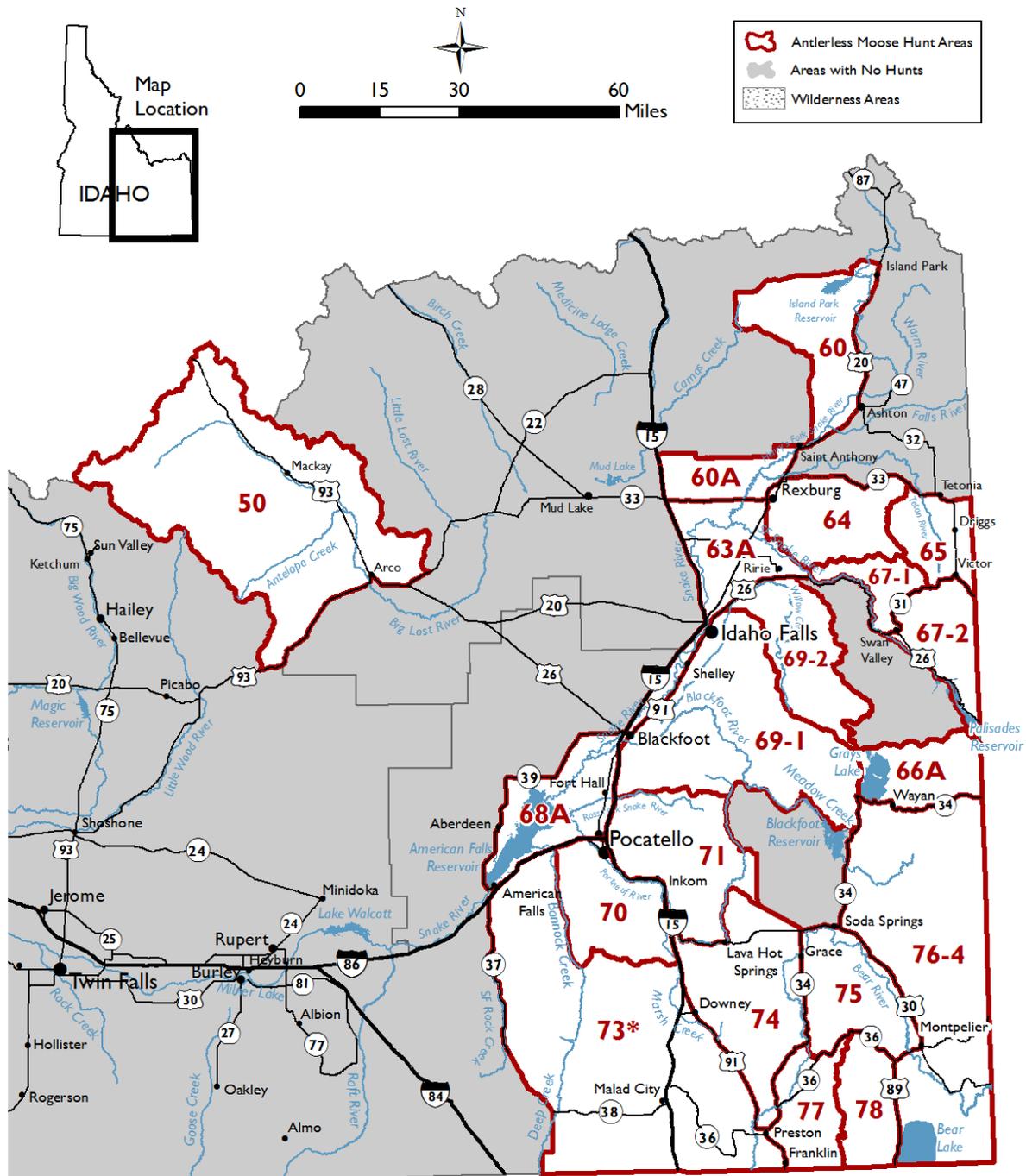


Figure 10. Southeast and Upper Snake Antlerless Moose Hunt Areas. Hunt area 68A added for 2015 season.

Table 1. Total observed moose by sex/age class and model estimates of moose from aerial surveys, Southeast Region, 1991-2002.

Hunt area Year	Observed		Estimate	
	Total	Bull:cow:calf	Total	Bull:cow:calf
76-1, 2				
1994	90	42:100:42	432	26:100:50
2000	286	74:100:42	510±83	74:100:42
76-3, 4				
1993	104	76:100:37	192	76:100:36
1997	89	85:100:44	190	100:100:53
76-5, 6				
1991	136	49:100:60		
1995	121	55:100:40	167±22	54:100:34
2002	103	117:100:34	174±40	110:100:35
76				
1999	140	100:100:62	583±146	99:100:60
66A				
1995	159	69:100:49	285±60	67:100:43
2002	152	64:100:39	219±31	71:100:37

Table 2. Moose harvest and drawing odds, Southeast Region, 2006-present.

Year	Tags	Harvest			Hunter success (%)	First-choice applicants	Drawing odds (%)
		M	F	Total			
2006	160	81	40	121	76	647	24.7
2007	160	80	39	119	74	715	22.4
2008	160	72	37	109	68	667	24.0
2009	160	80	44	124	78	809	19.8
2010	160	71	36	107	67	696	23.0
2011	127	63	23	86	68	788	16.1
2012	127	63	27	90	71	623	20.4
2013	130	70	23	93	72	793	16.4
2014	130	66	31	97	75	732	17.8
2015	123 ^a	64	24	88	72	831	14.8
2016	123	59	19	78	63	913	13.5

^a One each Archery antlered and Archery antlerless hunts added in 2015.

Table 3. Moose harvest and drawing odds by Hunt Area, Southeast Region, 2007-present.

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
66a	2007	25	10	6	64	7.2	170	14.7
	2008	25	12	8	80	4.7	131	19.1
	2009	25	13	8	84	4.6	151	16.6
	2010	25	14	5	76	5.5	147	17.0
	2011	15	9	3	80	6.1	129	11.6
	2012	15	9	3	80	6.8	85	17.6
	2013	15	6	2	53	7.1	120	12.5
	2014	15	6	2	53	11.1	87	17.2
	2015	15	8	1	60	7.7	10	15.0
	2016	15	7	0	47	17.7	108	13.9
68A ^a	2015	4	1	0	25	14.0	31	12.9
	2016	4	2	1	75	5.3	16	25.0
70	2007	5	5	0	100	10.5	75	6.7
	2008	5	5	0	100	10.8	50	10.0
	2009	5	4	0	80	4.0	99	5.1
	2010	5	5	0	100	22.0	68	7.4
	2011	5	4	0	80	7.8	105	4.8
	2012	5	5	0	100	4.6	89	5.6
	2013	8	6	1	88	11.4	131	6.1
	2014	9 ^b	8 ^b	1	100	6.0	89	9.0
	2015	8	6	2	100	8.6	109	7.3
	2016	8	6	2	100	12.5	93	8.3
71	2007	20	8	7	75	2.5	45	44.4
	2008	20	6	4	50	7.0	52	38.5
	2009	20	6	7	65	5.8	58	34.5
	2010	20	2	6	40	7.5	25	80.0
	2011	20	7	4	55	10.9	32	62.5
	2012	20	3	4	35	4.4	39	51.3
	2013	20	8	5	65	8.8	49	40.8
	2014	20	7	5	55	8.4	56	35.7
	2015	11	3	4	64	3.7	41	26.8
	2016	11	2	1	27	7.6	52	21.2
72	2007	5	4	0	80	11.8	34	14.7
	2008	5	5	0	100	12.2	41	12.2
	2009	5	5	0	100	10.6	36	13.9
	2010	5	5	0	100	12.4	44	11.4
	2011	5	4	0	80	14.0	35	14.3
	2012	5	2	0	40	9.0	35	14.3
	2013	5	4	0	80	9.0	38	13.2
	2014	5	4	0	80	5.5	45	11.1
	2015	5	4	0	80	5.0	49	10.2
	2016	5	5	0	100	5.8	78	6.4

Table 3 Continued

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
73/73A ^c	2011	6	6	0	100	15.8	96	6.3
	2012	5	5	0	100	8.7	86	5.8
	2013	5	5	0	100	7.2	103	4.9
	2014	5	4	0	80	5.0	107	4.7
	2015	8	5	3	100	11.9	100	8.0
	2016	8	5	2	88	12.6	124	6.5
74	2007	5	5	0	100	10.4	23	21.7
	2008	5	3	0	60	12.0	22	22.7
	2009	5	5	0	100	16.5	29	17.2
	2010	5	5	0	100	19.0	34	14.7
	2011	5	4	0	80	8.5	33	15.2
	2012	5	4	0	80	19.0	21	23.8
	2013	5	5	0	100	16.8	39	12.8
	2014	5	5	0	100	8.0	40	12.5
	2015	7	5	0	71	4.8	52	13.5
	2016	7	4	1	71	5.2	45	15.5
75	2007	10	5	3	80	3.6	26	38.5
	2008	10	4	4	80	11.4	40	25.0
	2009	10	4	4	80	6.9	71	14.1
	2010	10	4	3	70	5.9	51	19.6
	2011	10	4	4	80	11.0	47	21.3
	2012	10	4	1	50	8.3	49	20.4
	2013	10	3	3	60	6.2	57	17.5
	2014	10	4	3	70	6.4	38	26.3
	2015	10	2	3	50	3.8	49	20.4
	2016	10	4	4	80	15.3	59	16.9
76	2007	70	32	15	78	6.7	290	24.1
	2008	70	28	13	59	6.7	270	25.9
	2009	70	36	14	71	6.9	299	23.4
	2010	70	24	16	57	9.1	231	30.3
	2011	42	18	8	62	6.7	210	20.0
	2012	42	22	12	81	6.6	143	29.4
	2013	42	22	6	67	8.8	170	24.7
	2014	42	21	10	74	7.0	186	22.6
	2015	37	21	6	73	8.6	219	16.9
	2016	37	18	5	62	11.6	229	16.2
77	2007	10	5	3	80	6.7	28	35.7
	2008	10	4	4	80	15.1	38	26.3
	2009	10	5	3	80	8.5	29	34.5
	2010	10	4	3	70	8.9	41	24.4
	2011	10	2	1	30	6.3	37	27.0
	2012	10	4	3	70	7.3	25	40.0
	2013	10	6	1	70	18.0	32	31.3
	2014	10	4	5	90	15.0	32	31.3

Table 3 Continued

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
	2015	8	5	3	100	11.4	31	25.8
	2016	8	3	1	50	20.0	50	16.0
78	2007	10	5	4	90	5.5	24	41.7
	2008	10	5	4	90	5.4	23	43.5
	2009	10	4	5	90	7.4	37	27.0
	2010	10	5	5	100	5.7	45	22.2
	2011	10	5	4	90	11.75	64	15.6
	2012	10	5	5	100	3.7	51	19.6
	2013	10	4	5	90	8.0	54	18.5
	2014	10	4	4	80	7.3	52	19.2
	2015	10	4	2	60	6.0	50	20.0
	2016	10	3	2	50	6.6	59	16.9

^a Archery only hunts added 2015.

^b Included a Super Hunt.

^c Prior to 2011 Hunt Area included GMUs 56, 73, and 73A. In 2011 and 2012 Hunt Area 73 was established and included GMUs 73 and 73A.

Table 4. Known moose mortalities, excluding Controlled Hunts, Southeast Region, 2003-present.

Year	Mortality agent						Total
	Native American harvest	Illegal kill	Road kill	Natural	Train kill	Other	
2003	0	0	2	3	0	1	6
2004	0	0	2	1	0	0	3
2005	0	1	2	0	0	0	3
2006	0	0	1	3	0	0	4
2007	0	1	1	5	0	0	7
2008	0	1	1	3	0	1	6
2009	0	0	4	1	0	0	5
2010	0	0	0	0	0	1	1
2011	0	2	3	1	0	3	9
2012	1	0	7	2	0	5	15
2013	1	0	3	4	0	2	10
2014	5	1	0	0	0	3	9
2015	0	1	4	0	0	0	5
2016	0	0	1	1	0	1	3

UPPER SNAKE REGION

Abstract

Hunting season lengths for antlered and antlerless moose remained at 86 days (30 Aug-23 Nov) and 40 days (15 Oct-23 Nov), respectively, in 2016. (Figures 11 & 12). Due to concerns over hunter success and/or bull quality, tag numbers for the 2009 season were reduced significantly from the 2008 levels. Twenty one Controlled Hunts with 182 tags were offered for antlered moose and 10 Controlled Hunts with 55 tags were offered for antlerless moose in the Upper Snake Region in 2016 (Table 1). A total of 144 antlered (79% hunter success) and 42 antlerless (76% success) moose were harvested in 2016 as determined by BGMR reports. The mean antler spread for all antlered hunts was 36.7 inches for 2016. Overall drawing odds in the region for moose hunts were 14.6% in 2016. (Table 1).

Other sources of moose mortality are Native American harvest, natural, road-kill, train-kill, illegal, and other. Sixteen non-harvest mortalities were reported for the Upper Snake Region in 2016. (Table 2).

Climatic Conditions

Overall, climatic conditions were average to above average for moose throughout this reporting period. The summer of 2016 was hotter and drier than average. The region saw insignificant amount of rainfall during the months of July and August. The winter of 2016-2017 came early with below average temperatures and above normal snowpack that persisted through the end of February. A major temperature inversion occurred in early March which reduced much of the snow on winter ranges throughout the region. Crusting conditions were moderate throughout the region during this reporting period.

Depredation, Capture, and Translocation

Nuisance moose complaints in and around houses and towns are common in the Upper Snake Region and are often dealt with through hazing, public education, or relocation of the animal. Despite the above normal snowpack conditions in the 2016-17 winter, there were fewer nuisance moose complaints than expected. However, some moose had to be moved from human habitation due to conflicts and human safety concerns. Regional staff chemically immobilized 11 moose and relocated them to suitable, occupied moose habitat within the Upper Snake Region

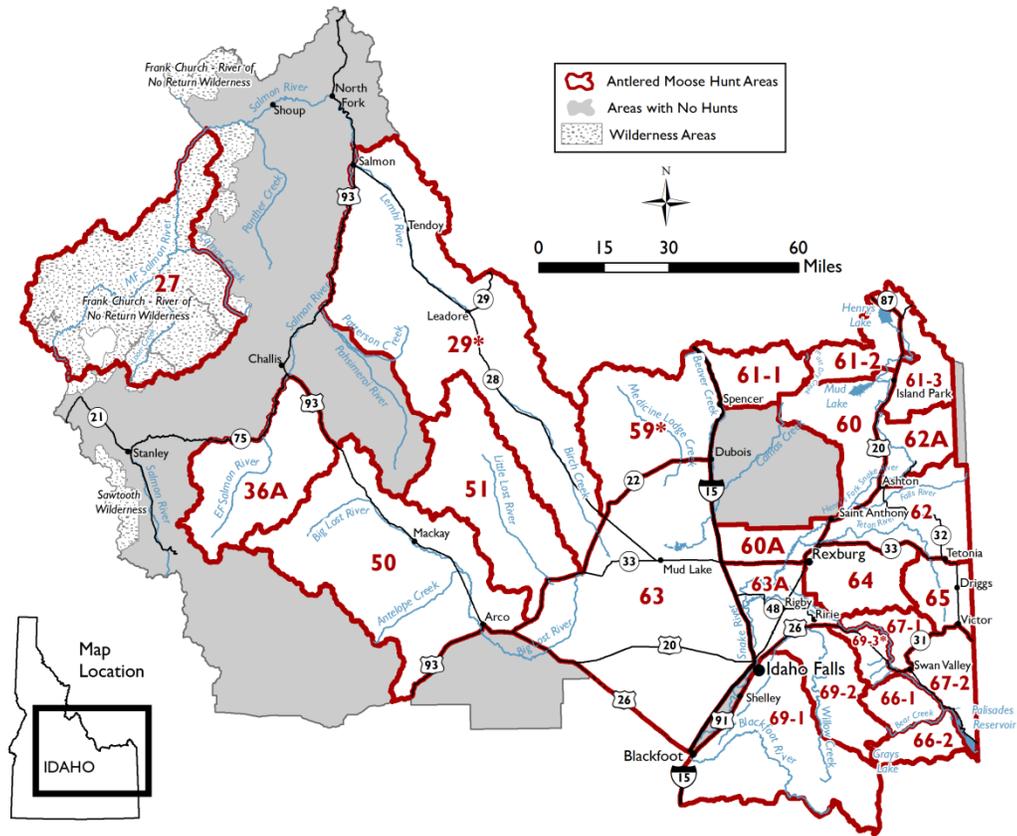


Figure 11. Upper Snake and Salmon Antlered Moose Hunt Areas.

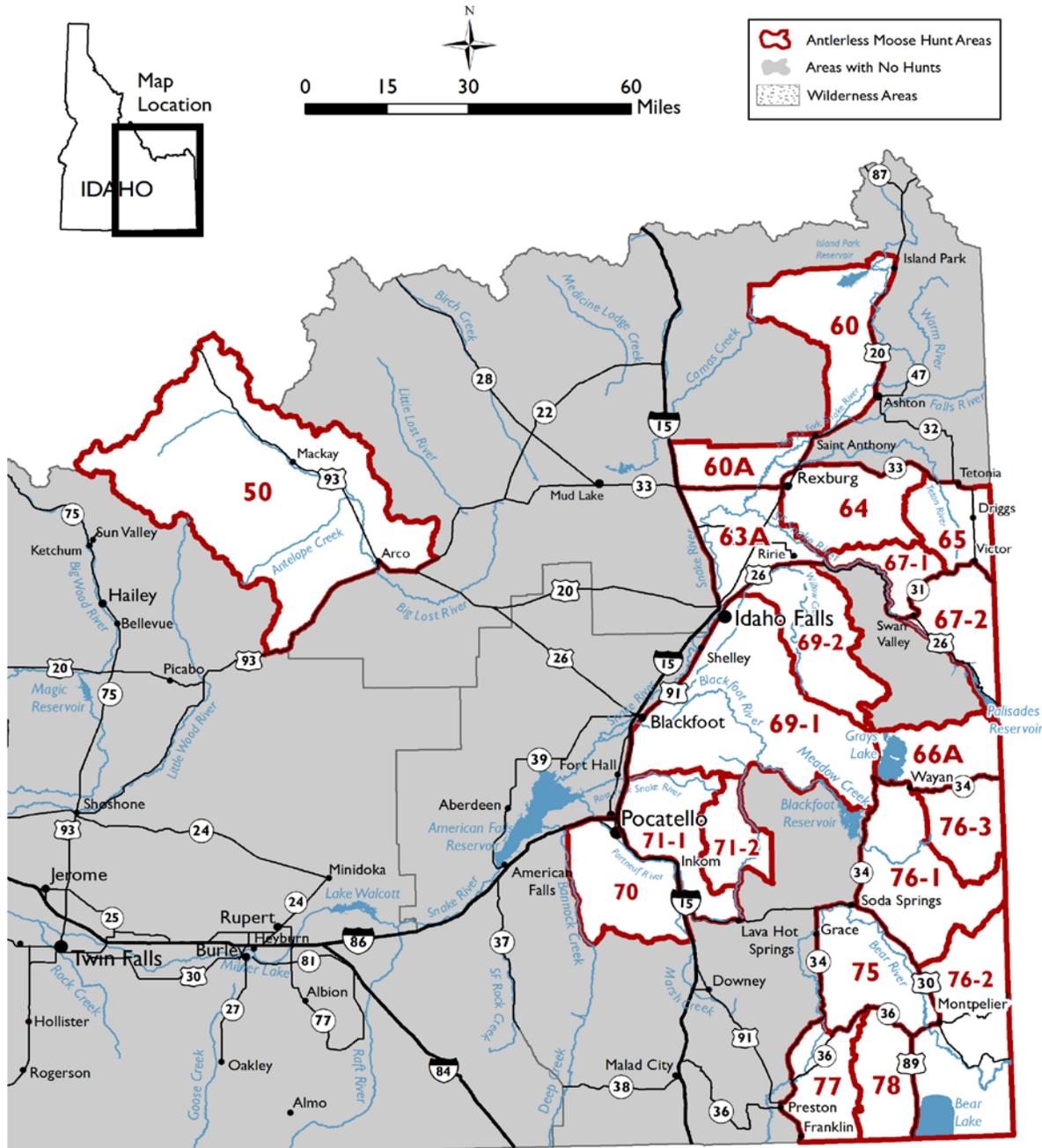


Figure 12. Southeast and Upper Snake Antlerless Moose Hunt Areas.

GMUs 50, 51, 58, 63, 63A
Controlled Hunt Areas 50, 51, 63, 63A

Background

In early 1980, 6 moose were released near North Fork of the Big Lost River (GMU 50). Most initially remained close to their release site, but there has been egress to other areas. Reproduction occurred, and additional transplants augmented this population. During winter 2001-2002, several nuisance moose were also translocated to GMU 50.

An antlered hunt in GMU 50 was initiated in 1993 and an antlerless hunt was initiated in 2003. An antlered moose hunt was opened in GMU 51 in 1999 as a result of an increasing number of moose being sighted incidentally during deer and elk sightability surveys and ground observations. In 2003 and 2004, an antlered hunt was authorized in GMU 58 for the same reason but was subsequently closed in 2005.

A significant population of moose exists in GMU 63A. Moose utilize riparian habitat along the North and South Forks of the Snake River and associated sloughs, and depredation and nuisance complaints occur on a fairly regular basis. Moose distribution in GMU 63 is dispersed around the Mud Lake Wildlife Management Area (WMA)-Camas National Wildlife Refuge (NWR) area.

Hunt Area 63A was initiated in 1987. GMU 63 was added to Hunt Area 63A in 1999 and was then split into 2 separate hunts (Hunt Areas 63 and 63A) in 2003. Due to declines in harvest success, average antler spread, and moose observed during Mud Lake WMA spotlight surveys, all moose harvest was eliminated in Hunt Area 63 for the 2009 and 2010 seasons. During the 2013 season, tags were once again offered in Hunt Area 63 that included 2 antlered tags. These two tags were offered once again in 2016.

Population Surveys

On January 28, 2016, a moose survey was conducted in the Mud Lake area of GMU 63. Observations include location of a total of 22 moose with 11 adult antlerless moose, 3 antlered moose, 2 bull calves, 2 cow calves, and 3 unspecified calves.

Harvest Characteristics

A total of 42 tags were issued in these GMUs in 2016, resulting in the harvest of 34 animals (77% success). For 2016, mean antler spreads were 44.4 inches ($n = 5$) in GMU 50, 33.2 inches ($n = 3$) in GMU 51, and 38 inches ($n = 12$) in GMUs 63/63A. These numbers are based on mandatory harvest reports (Table 3).

Habitat Conditions

Habitats within these GMUs are quite varied. In GMU 50, extensive willow bottoms provide good summer and winter habitat, and the moose population appears to be increasing and ranging throughout the coniferous zone in summer. Habitat in GMUs 51 and 58 are limited to

discontinuous willow riparian areas. Habitat in GMU 63 is almost entirely desert and unsuitable for moose, except areas on and adjacent to Mud Lake WMA and Camas NWR. Habitat in GMU 63A consists primarily of the Snake River riparian zone adjacent to private residential and agricultural lands.

Management Implications

Based on harvest data, populations in most Hunt Areas appear to be relatively stable. However, there may need to be changes made in Hunt Area 51 moose harvest opportunity to address declines in success rates and average antler spread.

GMUs 59, 59A

Controlled Hunt Area 59

Background

Former Hunt Areas 59 and 59A were combined in 1993 to form the current Hunt Area 59. Prior to 1993, 2 hunts with a total of 12 antlered tags were offered in these GMUs. Former Hunt Area 59 had been open continuously since 1974 with tag levels fluctuating between 4 and 8 with over 90% hunter success reported. Hunt Area 59A was closed in 1978 after only 1 moose was harvested in the preceding 4 years. In 1983, this hunt was reopened and 2 tags were issued annually through 1988 with 100% hunter success. Four tags were issued each season from 1989-1992 with 100% hunter success. Due to declines in average antler spread and harvest success, combined with concerns from sportsmen and field personnel, harvest opportunity was significantly reduced in Hunt Area 59 for the 2009 and 2010 seasons. During the 2005-2008 seasons, there were 15 antlered and 5 antlerless tags available in this hunt. For the 2009 through 2015 seasons, tags were reduced and held to 5 antlered and no antlerless.

Population Surveys

A moose trend count was flown in GMUs 59 and 59A on 17-18 December 1994 using a Bell Model G47 Soloy helicopter. Counting conditions were good, with 8 or more inches of relatively new snow cover present over the entire area. All probable moose habitat was surveyed. A total of 179 moose (129 in GMU 59 and 50 in GMU 59A) with a bull:cow:calf ratio of 44:100:54 was counted on the survey. Of the 40 bulls counted, 13 were classified as yearlings, 20 as adults, and 7 had already shed antlers.

Few previous data are available for comparison. Prior to this count, no surveys had been conducted in GMU 59 since 1984 (64 total moose), and GMU 59A had never been surveyed specifically for moose. However, during deer and elk sightability surveys, moose were counted on an incidental basis. In 1991-1992, 46 moose were counted in GMU 59 and 71 in GMU 59A. In 1993-1994, 49 moose were observed in GMU 59 and 46 in GMU 59A (unclassified). The 1999-2000 survey resulted in a total count of 90 moose (10 bulls, 19 cows, 13 calves, 48 unclassified). The 2004-2005 survey resulted in a total count of 74 moose (6 bulls, 13 cows, 6 calves, 49 unclassified). During the 2008 Beaverhead elk survey, 11 and 13 moose were incidentally counted in GMUs 59 and 59A, respectively. Not all moose habitat is flown during

elk surveys, so these incidental numbers are not a reliable estimate of the number of moose in an area. No aerial surveys were conducted in this Hunt Area during the reporting period.

Harvest Characteristics

Five tags for antlered moose were offered in 2016, hunter success was 80% (Table 3) and mean antler spread was 37.6 inches ($n = 4$).

Known illegal kill (Table 2) was a serious problem in the early 1980s when it nearly equaled controlled harvest but has been of little significance, based on documented mortalities, in recent years.

Habitat Conditions

Habitat consists primarily of conifer/sagebrush and aspen ecotones. Riparian areas are limited and discontinuous. Habitat extends down major drainages that have willows. Improving riparian zone management would increase habitat quality and quantity in this area.

Management Implications

General observations suggest the moose population in these GMUs has declined in recent history. Additionally, average antler spread on harvested bulls was below the management objective of 35 inches during the 2005-2008 seasons. Therefore, tags were significantly reduced for 2009 and 2010 and continued through 2015 in an attempt to increase total numbers and bull quality in the Hunt Area. The effects of the tag reduction on average antler spread and harvest success should continue to be monitored.

GMUs 60, 60A, 61, 62, 62A

Controlled Hunt Areas 60, 60A, 61-1, 61-2, 61-3, 62, 62A

Background

During the 1970s, the moose population in Fremont County was thought to be declining and experiencing high levels of illegal mortality and Native American harvest. As a result, all moose hunts in Fremont County were closed in 1977. After a boundary change to include only Clark County, Hunt 61-1 was the only hunt open from 1977 to 1982.

A winter aerial survey conducted in 1983 counted moose in numbers slightly below the highs of the early 1950s. The Island Park area is the only area where counts were clearly lower than those in the 1952-1956 periods. In response to the population recovery, 8 Controlled Hunts were opened in 1983 in Fremont County.

A new hunt was established in GMU 60A in 1986. The Hunt Area consists of agricultural land and the riparian zone along Henrys Fork of the Snake River. Many residences and farms are in the area. The moose population within this corridor has been increasing. We received many depredation and nuisance complaints of moose in agriculture fields and near towns and residences, resulting in expanded antlerless hunting opportunity. Tags were reduced by approximately 50% on the Island Park caldera portion of the region in 1991 as a result of significant winter mortality during the winter of 1988-1989, but steadily increased through 2004 as the populations continued to grow. Like other portions of the region, tag levels were significantly reduced during 2005-2007 in an attempt to increase the number of larger bulls in the population.

Based on declines in harvest success and average antler spread in many of these Hunt Areas, along with concerns over the unknown effect of an expanding wolf population on moose numbers, antlered and antlerless tags were reduced within these hunts for the 2011 and 2012 seasons. A total of 55 antlered and 10 antlerless tags were offered in these GMUs since 2011, which was a 15% and 33% reduction in antlered and antlerless tags, respectively.

Population Surveys

A population survey was conducted in GMU 62 and a portion of 62A during December 2000. The survey in 62A was not completed because of fiscal constraints. The final population estimate for GMU 62 was 366 moose including 180 cows, 109 bulls, and 77 calves (Table 4). This total compares to fixed wing censuses of 228 cows and 97 bull moose observed during 1989 and 1990, respectively.

Most of the area was surveyed by airplane from November 1989-February 1990 (Table 5). Survey results indicated that moose populations had decreased substantially since the previous winter. Moose appeared to be in poor condition prior to the 1988-1989 winter, following 2 years of drought, and significant winter losses probably occurred. In 2011, 125 moose were counted incidental to the Teton elk survey (portions of GMUs 65, 62, and 62A).

A helicopter survey was conducted along the North Fork Snake River corridor between St. Anthony and the Highway 33 Bridge in Hunt Area 60A in December 1991. Only the riparian corridor was searched, so this should be considered a minimum count. A total of 37 moose were observed (2 bulls, 21 cows, 14 calves).

Moose have been counted incidental to deer and elk sightability surveys in GMU 60A on a fairly regular basis. However, moose distribution varies greatly from year to year and, since not all search GMUs are surveyed, the utility of this information is less than optimal.

In 2010, a total of 241 moose (104 cows, 61 bulls, 55 calves, 21 unclassified) were counted incidental to an elk sightability survey in GMU 60A (and small portions of GMUs 60, 61, and 62A). This was the first time in recent history an effort was made to document composition of the moose seen incidentally to an elk or deer survey. Other recent totals for GMU 60A (most unclassified) include 328 (2007), 239 (2004), 185 (2003), 387 (2002), 473 (2000), 585 (1998), 340 (1997), 219 (1996), 272 (1996), 360 (1995), 187 (1994), and 312 (1993). Twenty-two moose were counted incidental to the 2010 elk survey in GMUs 62 and 65 East (12 cows, 6 bulls, 4 calves) and 38 moose (unclassified) were counted during 2007 deer trend surveys in GMU 62.

Harvest Characteristics

Sixty-five moose tags were issued in 2016, resulting in the harvest of 47 animals (72% success) based on BGMR reports (Table 3). Mean antler spreads were 35.1 ($n = 14$) in GMU 60, 34.7 ($n = 3$) in GMU 60A, 32.4 ($n = 16$) in GMU 61, 30.9 ($n = 2$) in GMU 62, and 42.7 inches ($n = 4$) in GMU 62A.

Management Implications

The increase in desert-wintering moose has led to increased depredations and nuisance complaints during average to severe winters. Mortality during the 1988-1989 winter resulted in significant population declines. However, moose populations have rebounded rapidly to levels above those present prior to the 1988-1989 die-offs. Consequently, tag levels were increased accordingly through 2004. Populations appear to be relatively stable, but mean antler spread and harvest success declined in many Hunt Areas between 2007 and 2009. The influence of wolves on the moose population in the Island Park caldera is not well understood. Therefore, harvest metrics should continue to be monitored carefully into the future. Research designed to investigate the relationship between wolves and moose in this area would be beneficial to effective moose management.

GMUs 64, 65, 67

Controlled Hunt Areas 64, 65, 67-1, 67-2

Background

All of GMU 64 except the Canyon Creek drainage, GMU 65, and GMU 67 north and west of State Highway 31 has been open to moose hunting since 1974. In 1983, this area (old Hunt Area 364) was split along GMU boundaries into 3 separate hunts. Increasing moose populations

allowed a steady increase in tag levels until 1987. A new Hunt Area, 67-2, was created in 1983 and allowed the harvest of moose in that portion of GMU 67 previously closed. An antlerless hunt with 5 tags was created in 2005 in GMU 65.

Hunting opportunity has increased in these GMUs from 1 hunt with 2 tags during the early 1980s to 7 hunts with 78 tags (58 antlered and 20 antlerless tags) in 2004. Tags were subsequently reduced in 2005 to 65 (45 antlered and 20 antlerless) and have remained at this level since.

Population Surveys

Historically, moose populations appeared to be increasing in these GMUs prior to the winter of 1988-1989. Forage was impacted by 2 years of drought and moose shifted their distribution to lower elevation agricultural and urban areas. Moose appeared to be in poor condition and significant winter losses likely occurred.

During winter 1992-1993, moose were first counted incidental to elk sightability surveys. Totals of 48, 26, and 90 moose were counted in GMUs 64, the western portion of 65, and 67, respectively. Most animals counted were unclassified. Moose were also counted incidental to elk sightability surveys during the 1995-1996 winter. Totals of 36, 101, and 60 moose were observed in GMUs 64, 65, and 67, respectively. Again, most animals were not classified. Moose were again counted incidentally during the 1997-1998 winter. Totals of 67, 30, and 88 (largely unclassified) moose were counted in GMUs 64, western 65, and 67, respectively. Moose were counted in GMUs 64, 65, and 67, incidental to elk surveys during the 2003-2004 winter and a total of 110 moose were observed. In 2007, a total of 38 moose were counted in GMU 64 incidental to mule deer trend surveys. During 2008, 139 moose were counted incidental to the Palisades elk survey (31 in GMU 64, 43 in GMU 65, and 65 in GMU 67). A total of 237 (59 in GMU 64, 107 in GMU 65, and 71 in GMU 67) moose (unclassified) were counted incidental to the Palisades deer survey in 2010.

Harvest Characteristics

Hunters harvested 47 moose on 60 tags (78% hunter success) in 2016 (Table 3). Mean antler spreads were 37.4 ($n = 8$) in GMU 64, 40.5 ($n = 9$) in GMU 65, and 35.5 inches ($n = 18$) in GMU 67.

Habitat Conditions

Conifer with interspersed aspen and narrow riparian areas make up the majority of moose habitat in this area. Mountain mahogany on south-facing ridges provides important winter moose habitat in GMUs 65 and 67. In GMU 64, moose are found wintering primarily in stream bottom willow/aspen/dogwood communities.

Management Implications

A 1989 aerial survey found approximately half the number of moose counted in 1985. A shift in moose distribution resulting from drought and severe winter conditions was partially responsible for the low count. Also, mortality during the 1988-1989 winter was above normal. Tag levels were maintained for the 1989 and 1990 seasons, but were adjusted in 1991 in response to data

analysis. Moose populations appear to have rebounded rapidly to levels at or above those present prior to the 1988-1989 die-off. Consequently, tag levels increased in 1993, 1995, 1997, and again in 1999. Additionally, an antlerless hunt was initiated in GMU 64 in 1993. Bull tags were reduced, starting in 2005, in an attempt to increase the number of larger bulls in the population. In recent years, the moose population appears relatively stable (based on incidental counts) and the bulls harvested in GMUs 65 and 67 have had the highest average antler spread in the Upper Snake Region.

GMUs 66, 69

Controlled Hunt Areas 66-1, 66-2, 69-1, 69-2, 69-3

Background

The moose population in these GMUs increased at a fairly rapid rate during the late 1970s when populations elsewhere in Upper Snake Region were decreasing or remaining static. Hunts 66 and 69 were split in 1981 to create 4 hunts (66-1, 66-2, 69-1, and 69-2). This resulted in a 50% increase in tag levels from 1980 (16 to 24). A new hunt (69-3) was created in 1984 from adjacent portions of Hunts 66-1 and 69-2.

Hunt 69-1 was changed from antlered-only to either-sex in 1986 to address landowner concerns over grain field depredations. Either-sex tags were not effective in harvesting antlerless moose; no female moose were harvested. As a result, this hunt was changed back to antlered-only in 1991. However, beginning in 1993, an antlerless hunt (69-4) was initiated. This hunt had 10 tags and included all of GMU 69. In 1999, GMU 66 was added to this hunt, tags were increased to 20, and it was renumbered Hunt Area 66-3. This antlerless hunt was restructured again in 2001. GMU 66 was dropped from the Hunt Area and GMU 69 was split into 3 Hunt Areas (69-1, 69-2, and 69-3) that correspond to the like-numbered antlered hunts.

Average antler spread of bull moose harvested in GMU 66 from 2004-2008 was below the management goal of 35 inches. Therefore, both antlered and antlerless tags were reduced (antlerless tags eliminated) for the 2009 and 2010 seasons to increase moose numbers and increase trophy quality of bulls. Seven hunts with 55 antlered tags and 10 antlerless tags were offered in GMUs 66 and 69 during 2011, compared with 60 antlered tags and 15 antlerless tags that were offered from 2009-2010. This was a 8% reduction in antlered and a 33% reduction in antlerless tag levels.

Population Surveys

No population surveys have been conducted in these GMUs specifically to monitor moose populations. However, moose were counted incidentally during deer and elk sightability surveys (not all subunits containing moose were surveyed). A total of 276 moose (131 cows, 89 bulls, 59 calves) were counted incidentally to the Tex Creek elk survey (GMUs 66 and 69) in 2010. Other recent totals, during various deer and elk surveys, include 169 (2008), 304 (2007), 384 (2005), 317 (2000), 228 (1999), 293 (1997), 200 (1995), 98 (1994), and 147 (1992).

Harvest Characteristics

Seven hunts with a total of 65 tags were offered in these GMUs in 2016 (Table 3). A total of 53 moose were harvested on 65 tags (82% success). Mean antler spreads were 38 ($n = 15$) in GMU 66 and 38.1 inches ($n = 28$) in GMU 69.

Habitat Conditions

GMU 66 is characterized by conifer/aspen habitats with narrow canyon bottom riparian areas which support moderate willow/dogwood communities. GMU 69 is primarily aspen/sagebrush and private agricultural land with willow riparian areas in most canyon bottoms. Tex Creek WMA contains important winter habitat for a variety of ungulates, including moose; and moose from adjacent areas may be migrating to the WMA to winter.

Management Implications

Steadily increasing moose populations in these GMUs resulted in an increase in tag levels in all of these hunts from the early 1990's through 2005. Additionally, an antlerless hunt has been offered since 1993. Bull tags were reduced, starting in 2005, in an attempt to increase the number of larger bulls in the population. Mean antler spread of bulls harvested remained slightly below the management goal of 35 inches from 2004-2008, in most Hunt Areas. GMUs 66 and 69 have the habitat conditions needed to produce trophy-class bulls. In an effort to increase bull quality, a number of bull and cow tags in these GMUs (particularly in GMU 66) were eliminated during the 2009-2010 trophy species season setting process. These changes should continue to be monitored to evaluate their effectiveness in increasing trophy bull quality.

Table 1. Moose harvest and drawing odds, Upper Snake Region, 2006-present.

Year	Tags	Harvest			Hunter success (%)	First-choice applicants	Drawing odds (%)
		M	F	Total			
2006	350	183	92	275	79	1,311	26.7
2007	350	203	76	280	80	1,505	23.3
2008	350	183	85	268	77	1,498	23.4
2009	260	147	53	200	77	1,339	19.4
2010	260	162	53	215	83	1,276	20.4
2011	235	144	45	189	80	1,393	16.9
2012	235	156	45	201	86	1,382	17.0
2013	242	159	39	198	82	1,591	15.2
2014	237	150	43	193	81	1,541	15.4
2015	237	162	41	203	86	1,712	13.8
2016	239a	144a	42	186	78	1,626	14.6

Table 2. Known moose mortalities, excluding Controlled Hunts, Upper Snake Region, 2003-present.

Year	Mortality Agent						Total
	Native American Harvest	Illegal kill	Road kill	Natural	Train kill	Other	
2003	0	2	14	3	0	0	19
2004	0	6	22	0	0	7	25
2005	0	1	27	5	0	6	39
2006	0	2	23	1	0	5	31
2007	0	1	1	9	0	2	13
2008	1	0	2	0	0	2	5
2009	0	1	0	3	0	3	7
2010	0	1	0	1	0	0	2
2011	0	3	0	1	0	16	20
2012	0	2	0	1	0	7	10
2013	0	0	2	0	0	1	3
2014	0	0	1	1	0	3	5
2015	0	1	5	5	0	8	19
2016	0	0	2	9	1	4	16

Table 3. Moose harvest and drawing odds by analysis area, Upper Snake Region, 2007-present.

Analysis area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
50, 51	2007	45	20	15	78	4.0	170	26.5
58 ^a , 63	2008	45	18	14	71	6.4	174	25.9
63A	2009	35	20	12	91	6.7	225	15.6
	2010	35	14	13	77	5.3	191	18.3
	2011	40	19	12	78	5.0	236	16.9
	2012	40	20	12	80	4.8	226	17.7
	2013	42	25	11	86	5.0	284	14.8
	2014	42	23	12	83	5.1	280	15.0
	2015	42	26	12	91	5.6	314	13.4
	2016	43 ^b	21	13	77	6.3	296	14.2
59, 59A	2007	20	13	4	85	4.4	109	18.3
	2008	20	15	4	95	6.1	74	27.0
	2009	5	3	0	60	11.0	39	12.8
	2010	5	4	0	80	9.0	30	16.7
	2011	5	5	0	100	11.8	45	11.1
	2012	5	5	0	100	4.8	48	10.4
	2013	5	5	0	100	3.4	58	8.6
	2014	5	5	0	100	9.4	47	10.6
	2015	5	5	0	100	9.4	62	8.1
	2016	5	4	0	80	12.0	54	9.3
60, 60A	2007	120	73	22	79	5.4	531	22.6
61, 62	2008	120	59	29	73	5.7	479	25.1
62A	2009	80	50	13	79	6.5	408	19.6
	2010	80	49	12	76	7.3	379	21.1
	2011	65	45	8	82	6.5	420	15.5
	2012	65	49	9	89	5.5	384	16.9
	2013	65	47	5	80	6.5	460	14.1
	2014	65	47	7	83	8.1	458	14.2
	2015	66 ^c	45	10	85	8.3	476	13.7
	2016	65	39	8	72	6.3	454	14.3
64, 65	2007	65	40	15	85	6.8	236	27.5
67	2008	65	38	13	78	7.1	256	25.4
	2009	65	30	14	68	7.5	275	23.6
	2010	65	38	15	82	8.6	295	22.0
	2011	60	30	17	78	6.6	296	20.3
	2012	61 ^b	31	18	80	7.1	291	21.0
	2013	60	33	14	78	6.7	366	16.4
	2014	60	31	14	75	6.1	294	20.4
	2015	61 ^c	37	14	85	7.0	395	15.2
	2016	61 ^c	35	12	78	8.3	385	15.6
66, 69	2007	100	56	20	76	5.7	459	21.8
	2008	100	53	25	78	7.1	345	29.0

Table 3. Continued.

Analysis area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
	2009	75	44	13	76	7.3	392	19.1
	2010	75	53	11	85	5.4	295	25.4
	2011	65	45	5	77	7.7	396	16.4
	2012	65	51	6	88	6.2	433	15.0
	2013	65	49	9	89	5.1	418	15.6
	2014	65	44	10	83	6.1	462	14.1
	2015	66 ^c	49 ^c	5	83	7.6	465	14.0
	2016	65	45	8	82	7.5	437	14.9

^a No longer hunted beginning 2005.

^b Includes Super Hunt tag.

^c Includes rain check.

Table 4. Aerial survey of moose, Hunt Area 62, Upper Snake Region, 2000-2001.

	Observed	Estimated ($\pm 90\%$ CI)
Total moose	332	366 \pm 16
Cows	164	180 \pm 9
Bulls	98	109 \pm 8
Calves	70	77 \pm 5
Bulls:cows:calves	60:100:43	61:100:43

Table 5. Aerial survey of moose, Hunt Areas 60, 60A, 61, 62, Upper Snake Region.

Inclusive location	1990-1991		1991-1992	
	Bulls:cows:calves	Total	Bulls:cows:calves	Total
Middle to N Leigh Creek	67:100:83	15		0
Wiggleton Hollow to Johns Creek	56:100:56	19		7
N Fork Badger Creek to Bitch Crk	72:100:56	41		6
Bitch Creek to Conant Creek	7:100:68	49	56:100:67	20
Conant Creek to Fall River		14	27:100:55	20
Fall River Ridge to Cave Falls Rd	36:100:43	80		28
Cave Falls Rd to Fish Creek Rd		10	56:100:22	16
Fish Creek to Moose Creek		24		19
Warm River Hatchery to Survey Draw	17:100:67	11		5
Buffalo River		2		2
Macks Inn/Big Springs Henrys Lake Flat	42:100:52	59		19
Henrys Lake	22:100:56	16		19
Henrys Fork to Hatchery Butte west of Warm River	32:100:60	102		14
Humphrey to Spencer	73:100:55	25		14
Spencer to Rattlesnake Creek	25:100:75	24		23
Corral Creek to Spring Creek	5:100:47	29		7
West Camas Drainage		14		29
East Camas Drainage		9		4
Big Bend Ridge	14:100:105	88	22:100:122	68
Desert, east of Sand Creek		6		8
Desert, Red Rd to Sand Creek Rd ^a	100:100:100	85	65:100:41	50
Junipers and Hook of Sands ^a	118:100:44	103	33:100:67	18
Chokecherry Ridge and Second Sands ^a	69:100:45	63	72:100:36	48
Total		888		444

^a Moose counted in conjunction with helicopter deer survey, 18 December 1988.

SALMON REGION

GMUs 21, 21A, 27, 29, 30, 30A, 36A, 37, 37A

Controlled Hunt Areas 21, 27, 29, 36A

Abstract

Three Controlled Hunts with 13 total tags for antlered moose occurred in Salmon Region during the 2016 season. 12 of 13 hunters harvested moose (92% hunter success). Average antler spread was 36.8 inches; the 5-year running average is 37.0 inches. Interest in moose tags was up a little from 2015; 131 applicants selected Salmon Region hunts as first choices (drawing odds = 9.94%). GMU 37 was added to the 29 Hunt Area beginning 2015.

Climatic Conditions

Rainfall during summer months in 2016 was about average, with cool, moist weather during spring and dry, warm fall conditions. Vegetative growth was above-average. Winter conditions were severe, with below normal temperatures and above normal precipitation. In general, animals should have entered winter in above average body condition, but then encountered a severe winter, which may have resulted in average to slightly below average over-winter survival for adults. Snow-pack (as measured at higher elevations) was >100% of normal by early spring, 2017. Onset of spring weather and associated plant phenology was somewhat delayed, particularly at higher elevations. Water-year precipitation through June 2017 was >100% of average. Summer conditions in 2016 were cool and moist early and dry later.

Background

Habitats in these GMUs range from low elevation riparian river bottoms to sage-steppe to ponderosa pine to Douglas fir to lodgepole pine to spruce-fir forests at higher elevations. Willow shrub communities usually associated with moose habitat are not common. Portions of these GMUs contain extensive cliff and rock talus areas at both low and high elevations which support mountain mahogany plant communities, important wintering habitats for moose. Riparian plant communities are found in all but GMU 21 and provide important summer habitat.

Moose are commonly found in GMUs 21, 21A, 30, and 30A which border high-elevation summer habitat in Montana. Migrants from Montana may well have formed the initial nucleus for populations in GMUs bordering Montana. Cross-border movements are no doubt common in this area. No information exists on historical moose numbers other than an increase in moose sightings in recent decades. As a result, Hunt Area 21 (GMUs 21 and 21A) was initiated in 1990 with 3 tags. Similar increases in moose sightings resulted in establishment of Hunt Area 29 (GMUs 29 and 37A) in 1991 and Hunt Area 30 (GMUs 30 and 30A) in 1993. Hunt Area 30 was incorporated into Hunt Area 29 in 1999. Two new Hunt Areas were opened in 2005 with 1 tag each: 27 and 36A. GMU 58 (Upper Snake Region) was added to Hunt Area 29 beginning in 2007. Hunt Area 21 was closed beginning in 2011 because of low hunter success in recent years (Figure 13).

Population Surveys

Because of dense cover, low moose densities, and solitary habits of moose, formal population surveys are generally ineffective in occupied moose habitat in Salmon Region. Incidental observations of moose are recorded during aerial surveys for other ungulates. During 2016 - 2017 winter survey activities, 36 moose were observed in GMU 36A: 15 cows, 12 bulls and 9 calves.

Harvest Characteristics

Harvest and hunter information was compiled from Big Game Mortality Reports, which hunters must complete within 10 days of harvest; antlers of males must be presented to a Department representative. Tag levels (Table 1) and season structure (Appendix A) was unchanged for Hunt Areas 27, 29, and 36A. Thirteen antlered-moose tags were allocated between three Controlled Hunts in the Salmon Region for 2016. Twelve of 13 hunters harvested moose (92% success). Overall hunter success has varied over the last 10 years from 67% to 92%. Of 141 hunters since 2007, 114 (81%) have taken a moose (Table 1). Antler spread of moose harvested during the 2016 season ranged from 29.6 to 54.3 inches (mean = 36.8 in.). Since 1995, average spread ranged from 33.4 to 39.2 inches.

One moose death was attributed to non-hunting mortality during the 2016-2017 reporting period (Table 3). Non-hunting mortality ranged from 0 to 8 moose per year since 1982.

Habitat Conditions

Past logging operations and wildfire in primary moose range of GMUs 21 and 21A generally enhanced moose habitat by encouraging forb and shrub production in cutover areas. However, positive impacts may eventually be counter-balanced by negative effects of increased road access and loss of mature, dense-canopy forest stands used by moose for winter cover. A large wildfire burned through GMU 21 in 2013, and removed large blocks of mature, dense-canopy conifer.

Habitat in GMU's 29, 37 37A, and 36A have remained relatively unchanged over the last decade. Preferred areas within these GMUs appear to be riparian bottoms and stringers. The most beneficial habitat improvements to these riparian areas would be changes to livestock grazing that would decrease the time and intensity of grazing. Mountain mahogany is also an important browse species for moose. Improvements to unhealthy stands may be beneficial to moose populations.

Capture and Translocation

No moose capture or translocation operations were conducted in Salmon Region during the reporting period (Table 4). Opportunities exist to expand moose populations in GMUs 36 and 36B via capture and translocation.

Management Implications

Intensive population or habitat data will not be available for this area in the foreseeable future. Management will be based on moose sighting reports, incidental field observations of moose, and data from moose harvest and miscellaneous mortalities.

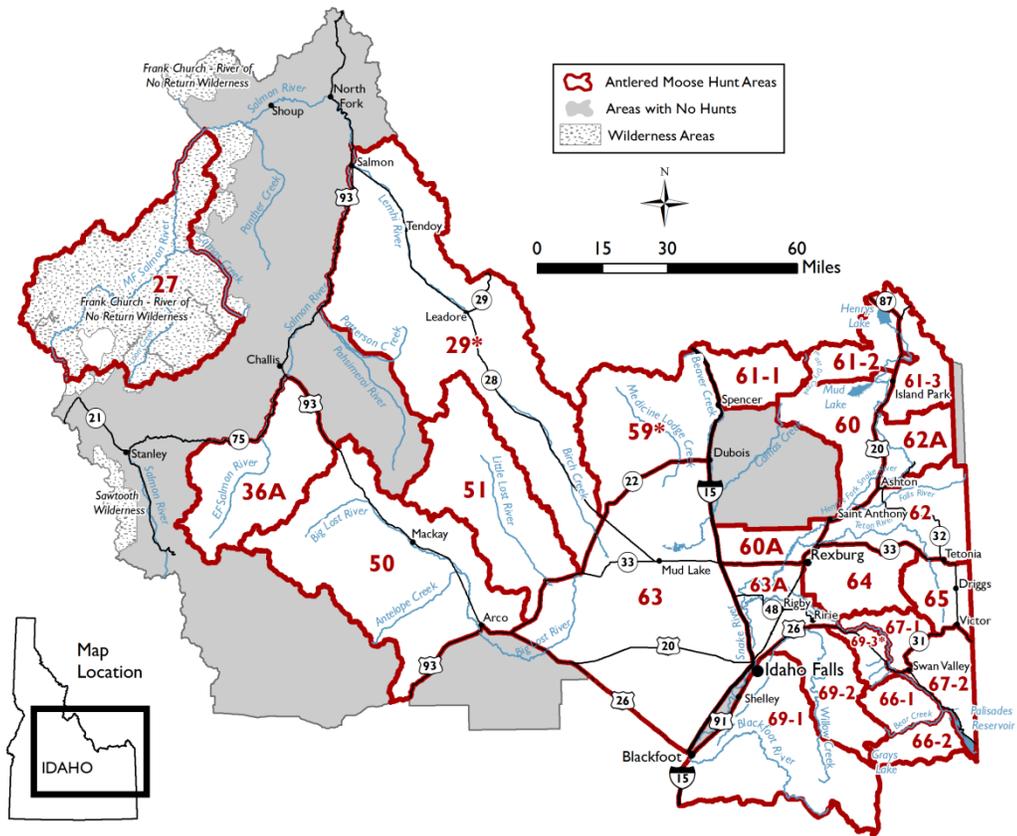


Figure 13. Salmon Antlered Moose Hunt Areas.

Table 1. Moose harvest and drawing odds, Salmon Region, 2006-present.

Year	Tags	Harvest			Hunter success (%)	First-choice applicants	Drawing odds (%)
		M	F	Total			
2006	16	13	0	13	81	119	13.4
2007	16	13	0	13	81	111	14.4
2008	16	11	0	11	69	113	14.2
2009	15	10	0	10	67	119	12.6
2010	16 ^a	13 ^a	0	13	81	116	13.8
2011	13	11	0	11	85	111	11.7
2012	13	12	0	12	92	124	10.5
2013	13	9	0	9	69	111	11.7
2014	13	12	0	12	92	145	9.0
2015	13	11	0	11	85	114	11.4
2016	13	12	0	12	92	131	9.9

^a Includes Super Hunt tag.

Table 2. Moose harvest and drawing odds by Hunt Area, Salmon Region, 2006-present.

Hunt Area	Year	Tags	Harvest		Hunter success (%)	Days/hunter	First-choice applicants	Drawing odds (%)
			M	F				
21 ^a	2006	4	2	0	50	12.5	9	44.4
	2007	4	2	0	50	6.0	4	100.0
	2008	4	1	0	25	11.0	6	66.7
	2009	2	0	0	0	0	0	
	2010	2	0	0	0	0	5	40.0
27	2007	1	1	0	100	10.0	4	25.0
	2008	1	0	0	0		2	50.0
	2009	1	0	0	0		5	20.0
	2010	1	0	0	0		2	50.0
	2011	1	0	0	0		2	50.0
	2012	1	0	0	0		0	
	2013	1	1	0	100	40	1	100.0
	2014	1	1	0	100	1	1	100.0
	2015	1	0	0			5	20.0
	2016	1	0	0			4	25.0
29	2007	10	9	0	90	5.1	87	11.5
	2008	10	10	0	100	5.7	97	10.3
	2009	11	9	0	82	11.0	99	11.1
	2010	11	11	0	100	4.7	99	11.1
	2011	11	10	0	91	8.1	102	10.8
	2012	11	10	0	91	6.0	108	10.2
	2013	11	8	0	73	9.0	95	11.6
	2014	11	10	0	91	18.3	133	8.3
	2015	11	10	0	91	6.0	93	11.8
	2016	11	11	0	100	4.9	115	9.6
36A	2007	1	1	0	100	10.0	16	6.3
	2008	1	0	0	0		8	12.5
	2009	1	1	0	100	4.0	15	6.7
	2010	2	2	0	100	16.5	10	20.0
	2011	1	1	0	100	2.0	7	14.3
	2012	1	1	0	100	2	16	6.3
	2013	1	0	0	0		15	6.7
	2014	1	1	0	100	1	11	9.1
	2015	1	1	0	100	6	16	6.3
	2016	1	1	0	100	7	12	8.3

^a Hunt ended in 2010.

Table 3. Known moose mortalities, excluding Controlled Hunts, Salmon Region, 2003-present.

Year	Mortality agent					Total
	Native American harvest	Illegal kill	Road kill	Natural	Other	
2003	0	0	3	1	0	4
2004	0	0	3	2	1	6
2005	0	1	0	1	1	3
2006	0	0	1	1	1	3
2007	0	0	0	1	0	1
2008	0	0	1	0	0	1
2009	0	1	3	0	0	4
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	0	0	2	0	0	2
2013	0	1	0	0	0	1
2014	0	0	2	1	1	4
2015	0	0	1	0	0	1
2016	0	0	1	0	0	1

Table 4. Moose translocation, Salmon Region, February 1993.

Capture site	Release site	Adults		Calves		Total
		M	F	M	F	
GMUs 60, 60A, 62 in various locations	GMU 36: Valley Cr.	1	2	0	0	3
	GMU 36: Decker Flat	0	2	1	0	3
	GMU 36: Gold Cr.	0	2	0	0	2

APPENDIX A
IDAHO
2016 SEASON
MOOSE RULES

Moose, Bighorn Sheep and Mountain Goat

2015 and 2016 Seasons and Rules



2015 - 2016 MOOSE HUNTING SEASONS

Antler Restrictions

- Only moose with at least one antler longer than six inches may be taken in any season open for antlered moose only.
- Only moose without antlers or with antlers less than six inches long may be taken in any season which is open for antlerless moose only.

Mandatory Check and Report Requirements

All successful moose hunters must report their harvest within 10 days of the date of the kill and have a big game mortality report completed. Any hunter killing an antlered moose must present the antlers to a conservation officer or at an Idaho Fish and Game regional office and have a big game mortality report completed within 10 days of the date of the kill. Fish and Game's headquarters office is not equipped to check in moose. In the Boise area, these animals can be checked at the Fish and Game regional office in Nampa (3101 S. Powerline Rd, 208-465-8465) weekdays between the hours of 8 a.m. and 5 p.m. or by appointment at the Garden City facility, 109 W. 44th St., 208-327-7095.

A hunter may authorize another person to comply with the above report requirements if that person possesses the necessary information to accurately complete the necessary form, see page 30.

Unsuccessful hunters must present or mail their unused tags to a Fish and Game office within 10 days after the close of the season for which the tag was valid. Tags can be mailed to: Idaho Fish and Game, Attn: Wildlife Bureau, PO Box 25, Boise, ID 83707. Cancelled tags will be returned to the hunter upon request. Failure to report may result in future ineligibility in moose drawings.

NOTE: Moose tags unfilled after the first drawing are available to any Idaho hunter during a second drawing. See page 37. Hunters who have previously harvested a bull and/or a cow moose and are not eligible for the first drawing may apply for and receive one of these tags in the second drawing or as a leftover tag if tags are still available.

No person may harvest more than one antlered and one antlerless moose in Idaho during their lifetime, except Super Hunt tag winners and leftover tag holders may harvest moose regardless of any previous harvest of moose in Idaho.

Drawing Odds: Drawings odds are an approximation of the probability of drawing a tag for each hunt in 2014 and were calculated by dividing the number of tags offered by the number of first choice applicants for that hunt in the 2014 drawing then converting to a percentage. New Hunts and controlled hunt areas with significant boundary changes for 2015 - 2016 have been designated as "New Hunts."

To review more detailed information about number of applicants or drawing odds for other years, please visit our website at <http://fishandgame.idaho.gov/CHodds>.

2015 - 2016 Antlered Moose Controlled Hunts - 714 Tags									
Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014	Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3001	1-1	50	Sep 15 - Dec 1	12%	3013	3	15	Sep 15 - Dec 1	12%
3002	1-1	15	Oct 1 - Oct 14	21%	3014	3	5	Oct 1 - Oct 14	26%
3003	1-1	15	Nov 1 - Nov 14	41%	3015	3	10	Nov 1 - Nov 14	28%
3004	1-2	20	Sep 15 - Dec 1	10%	3016	4	20	Sep 15 - Dec 1	5%
3005	1-2	5	Oct 1 - Oct 14	21%	3017	4	5	Oct 1 - Oct 14	11%
3006	1-2	10	Nov 1 - Nov 14	59%	3018	4	10	Nov 1 - Nov 14	13%
3007	1-3	5	Sep 15 - Dec 1	36%	3019	4A	5	Sep 15 - Dec 1	20%
3008	1-4	15	Sep 15 - Dec 1	26%	3020	5	15	Sep 15 - Dec 1	8%
3009	1-4	5	Nov 1 - Nov 14	45%	3021	5	5	Oct 1 - Oct 14	New Hunt
3010	2	20	Sep 15 - Dec 1	6%	3022	5	5	Nov 1 - Nov 14	New Hunt
3011	2	15	Oct 1 - Oct 14	25%	3023	6	20	Sep 15 - Dec 1	6%
3012	2	15	Nov 1 - Nov 14	25%	3024	6	5	Oct 1 - Oct 14	12%



2015 - 2016 Antlered Moose Controlled Hunts - continued

Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3025	6	5	Nov 1 - Nov 14	19%
3026	7	5	Sep 15 - Dec 1	13%
3027	7	5	Oct 1 - Oct 14	50%
3028	8	10	Aug 30 - Nov 23	8%
3029	8A	10	Aug 30 - Nov 23	7%
3030	9	5	Sep 15 - Dec 1	10%
3031	9	5	Oct 1 - Oct 14	26%
3032	10-1	6	Aug 30 - Nov 23	100%
3033	10-2	5	Aug 30 - Nov 23	19%
3034	10-3	10	Aug 30 - Nov 23	53%
3035	10-4	2	Aug 30 - Nov 23	33%
3036	10-5	2	Aug 30 - Nov 23	29%
3037	10-6	2	Aug 30 - Nov 23	100%
3038	10A-1	3	Aug 30 - Nov 23	100%
3039	10A-2	6	Aug 30 - Nov 23	25%
3040	10A-3	3	Aug 30 - Nov 23	50%
3041	10A-4	8	Aug 30 - Nov 23	10%
3042	10A-5	4	Aug 30 - Nov 23	29%
3043	12-1	2	Aug 30 - Nov 23	25%
3044	12-2	8	Aug 30 - Nov 23	80%
3045	12-3	2	Aug 30 - Nov 23	67%
3046	12-4	2	Aug 30 - Nov 23	33%
3047	12-5	2	Aug 30 - Nov 23	67%
3048	14	5	Aug 30 - Nov 23	12%
3049	16	2	Aug 30 - Nov 23	40%
3050	27	1	Aug 30 - Nov 23	100%
3051	29*	11	Aug 30 - Nov 23	8%
3052	36A	1	Aug 30 - Nov 23	9%
3053	44*	3	Aug 30 - Nov 23	9%
3054	50	5	Aug 30 - Nov 23	5%
3055	51	5	Aug 30 - Nov 23	19%
3056	54	1	Aug 30 - Nov 23	New Hunt
3057	55*	5	Aug 30 - Nov 23	4%
3058	59*	5	Aug 30 - Nov 23	11%
3059	60 ^a	15	Aug 30 - Nov 23	10%
3060	60A ^b	5	Aug 30 - Nov 23	16%
3061	61-1	10	Aug 30 - Nov 23	13%
3062	61-2	5	Aug 30 - Nov 23	13%
3063	61-3	10	Aug 30 - Nov 23	16%
3064	62	5	Aug 30 - Nov 23	22%

Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3065	62A	5	Aug 30 - Nov 23	19%
3066	63 ^c	2	Aug 30 - Nov 23	33%
3067	63A ^{b,d}	15	Aug 30 - Nov 23	16%
3068	64	10	Aug 30 - Nov 23	15%
3069	65	10	Aug 30 - Nov 23	12%
3070	66-1	10	Aug 30 - Nov 23	13%
3071	66-2	10	Aug 30 - Nov 23	14%
3072	66A	10	Aug 30 - Nov 23	15%
3073	67-1	10	Aug 30 - Nov 23	27%
3074	67-2	10	Aug 30 - Nov 23	20%
3075	69-1	15	Aug 30 - Nov 23	12%
3076	69-2	15	Aug 30 - Nov 23	12%
3077	69-3*	5	Aug 30 - Nov 23	22%
3078	70	6	Aug 30 - Nov 23	8%
3079	71	6	Aug 30 - Nov 23	New Hunt
3080	72	5	Aug 30 - Nov 23	11%
3081	73*	5	Aug 30 - Nov 23	5%
3082	74	5	Aug 30 - Nov 23	12%
3083	75	5	Aug 30 - Nov 23	16%
3084	76-1	10	Aug 30 - Nov 23	12%
3085	76-2	7	Aug 30 - Nov 23	24%
3086	76-3	10	Aug 30 - Nov 23	22%
3087	77	5	Aug 30 - Nov 23	17%
3088	78	5	Aug 30 - Nov 23	13%

MOOSE

Antlered Archery ONLY Hunt

Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3089	68A	2	Aug 30 - Nov 23	New Hunt

* See controlled hunt area descriptions. This hunt includes other units or parts of other units.

^a Short-range weapons only on Chester Wetlands WMA.

^b Short-range weapons only. Limited access.

^c Short-range weapons only on Mud Lake WMA

^d Motorboat advised for game retrieval.

↓
2015 - 2016 Antlerless Moose Controlled Hunts - 159 Tags

Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3090	2	40	Oct 15 - Dec 1	13%
3091	3	5	Oct 15 - Dec 1	9%
3092	5	5	Oct 15 - Dec 1	12%
3093	8	6	Oct 15 - Nov 23	13%
3094	8A	6	Oct 15 - Nov 23	13%
3095	50	5	Oct 15 - Nov 23	15%
3096	60 ^a	5	Oct 15 - Nov 23	15%
3097	60A ^b	5	Oct 15 - Nov 23	29%
3098	63A ^{b,c}	10	Oct 15 - Nov 23	37%
3099	64	5	Oct 15 - Nov 23	21%
3100	65	5	Oct 15 - Nov 23	38%
3101	66A	5	Oct 15 - Nov 23	25%
3102	67-1	5	Oct 15 - Nov 23	71%
3103	67-2	5	Oct 15 - Nov 23	36%
3104	69-1	5	Oct 15 - Nov 23	29%
3105	69-2	5	Oct 15 - Nov 23	18%
3106	70	2	Oct 15 - Nov 23	18%
3107	71	5	Oct 15 - Nov 23	New Hunt
3108	73*	3	Oct 15 - Nov 23	New Hunt
3109	74	2	Oct 15 - Nov 23	New Hunt

Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3110	75	5	Oct 15 - Nov 23	83%
3111	76-4	10	Oct 15 - Nov 23	New Hunt
3112	77	3	Oct 15 - Nov 23	100%
3113	78	5	Oct 15 - Nov 23	38%

Antlerless Archery ONLY Hunt

Hunt No.	Controlled Hunt Area	Tags	Season Dates	Drawing Odds in 2014
3114	68A	2	Oct 15 - Nov 23	New Hunt

^a Short-range weapons only on Chester Wetlands WMA.
^b Short-range weapons only. Limited access.
^c Motorboat advised for game retrieval.

IDAHO'S TRESPASS LAW *Know Before You Go!*

No person may enter private land to hunt fish or trap without permission if the land is

- Cultivated
- OR Posted with "No Trespassing" or similar signage every 660 feet (1/4th mile) or at all reasonable access points,
- OR Posted with 100 square inches of high visibility orange paint every 660 feet or all reasonable access points,
- OR Posted with high visibility orange paint on the top 18 inches of a metal fence post every 660 feet or all reasonable access points,
- OR Posted with signs where a public road enters and leaves property through or along which the public has a right-of-way.

Conviction of trespass on posted private property carries a mandatory one-year revocation of hunting/fishing/trapping licenses.

Federal law prohibits unauthorized trespass on Indian-owned reservation lands for hunting, fishing, or trapping purposes.

It is illegal for anyone to post public land that is not held under an exclusive control lease.

Refer to Idaho Code 36-1603
www.legislature.idaho.gov/idstat/Title36/T36.htm



Submitted by:

Wayne Wakkinen
Regional Wildlife Manager

Clay Hickey
Regional Wildlife Manager

Rick Ward
Regional Wildlife Manager

Regan Berkley
Regional Wildlife Manager

Daryl Meints
Regional Wildlife Manager

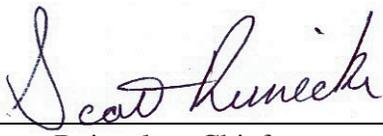
Josh Rydalch
Regional Wildlife Manager

Curtis Hendricks
Regional Wildlife Manager

Greg Painter
Regional Wildlife Manager

Approved by: IDAHO DEPARTMENT OF FISH AND GAME


Toby Boudreau, Asst. Chief
Bureau of Wildlife


Scott Reinecker, Chief
Bureau of Wildlife