

Moose Day Summary Report

8th Annual – February 27th, 2016



Photo taken by Kathy McCurdy. Moose Day 2016

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2016 marks the eighth annual Nature Mapping Jackson Hole (NMJH) Moose Day survey conducted in collaboration with the Wyoming Game and Fish Department (WGFD). Volunteer assistance was provided by Nature Mapping Volunteer Citizen Scientists, Wyoming Game and Fish Department, Grand Teton National Park and the Bridger-Teton National Forest. The purpose of Moose Day is to educate and engage citizen scientists while recording moose observations, document moose in areas that are difficult for the WGFD to survey (mostly private lands in the more developed areas), and contribute to tracking moose population trends in Jackson Hole over time.

In 2016, 61 areas of varying size were surveyed by 73 trained NMJH volunteer observers. These observers dedicated a combined total of 259 volunteer hours searching. Volunteers searched for moose by car, skis, snowmobiles and on foot.

The survey areas were located between Pacific Creek and Buffalo Valley on the north end of Jackson Hole to the Hoback and Snake River Canyons to the south. Surveys were conducted between daylight (approximately 7:00 AM) and noon by car, skis, foot or snowmobile (Gros Ventre drainage). Observers used public access and vantage points, obeyed winter range closures and accessed private lands with permission. Detailed search area maps and protocols were provided to each observer.

All moose observations were entered into the Nature Mapping on-line database. Only live moose were recorded while deceased moose, tracks and other sign were omitted. Ninety nine individual moose were observed in 2016 (Figure 1).

Table 1. Total moose observed during Moose Day from 2009-2016.

Year	Date	Total Moose Observed
2009	April 18	95
2010	February 27	86
2011	February 27	124
2012	February 25	94
2013	February 23	67
2014	March 1	74
2015	February 28	97
2016	February 27	99

Since 2009’s survey was conducted in April, a direct comparison is not appropriate based on different moose habitat use between February and April. Surveys in 2010-2013 and 2015-2016 were conducted in late February, and 2014 on the first day of March, thereby allowing for a comparison between years.

Weather:

Weather conditions were clear and cold, resulting in good visibility. The Snake River Basin was at 94% of the 30-year average of snow water equivalent as of March 1, 2016 (NRCS Snotel snow water equivalent data found at (<http://www.wrds.uwyo.edu/wrds/nrcs/snowprec/snowprec.html>) (Table 2). The snow water equivalent measures the depth and density of the snowpack. Higher snow water equivalents indicate a deeper, denser snowpack and lower ones indicate a shallower, less dense snowpack. In general, a deeper and denser snowpack causes moose to become more concentrated on valley bottoms and closer to roads, leading to higher observability on Moose Day.

Table 2. Snow water equivalent measurements and observer visibility scores from 2010-2014.

Year	Date of Average	Snow Water Equivalent	Observer visibility
2010	n/a	55%	good
2011	3/16/11	111%	excellent
2012	3/29/12	88%	poor
2013	3/10/13	89%	poor
2014	3/10/14	142%	poor
2015	3/1/15	99%	good
2016	3/1/16	93%	good

Low snow water equivalent measurements may enable moose to disperse across the landscape while higher snow water equivalents measurements may limit dispersal, restricting moose to the valley floor. This difference in snow water equivalent between the years could in part account for the varying numbers of moose observed. Variation in visibility conditions, such as in 2014, also has a direct effect on the number of moose observed. A continuation of this project into future years and a comparison with WGFD annual population estimates may provide for better comparisons between with similar environmental conditions and an overall trend. The data from NMJH Moose Day is most appropriately used as an indicator of moose population trend over time vs. year-to-year comparisons.

Survey Areas:

The five survey areas added in 2011 were assessed after the 2012 count and four will be maintained into the future. The 2011 report incorrectly reported that six areas were added. One of the new areas (Emily’s Pond area at the Wilson Snake River Bridge) accounted for one and two additional moose in 2011 and 2012, respectively. Survey areas were reworked slightly and renumbered for 2013. No areas with moose observations will be removed. Survey areas for 2015 were identical to the 2013 and 2014 survey areas (Figure 1).

Summary:

- 61 individual search areas were covered by 73 volunteers
- 99 individual moose were observed (Figure 1)

Sex and age identification are difficult in February due to antler drop in December and January. Thus, many observations are recorded as “unknown” (Table 3).

Table 3. Moose observations in 2016 by sex and age.

Sex/ Age	Adult	Yearling	Juvenile	Unknown	TOTAL
Female	44	0	4	0	48
Male	24	0	5	0	29
Unknown	6	1	11	4	22
TOTAL	75	0	20	4	99

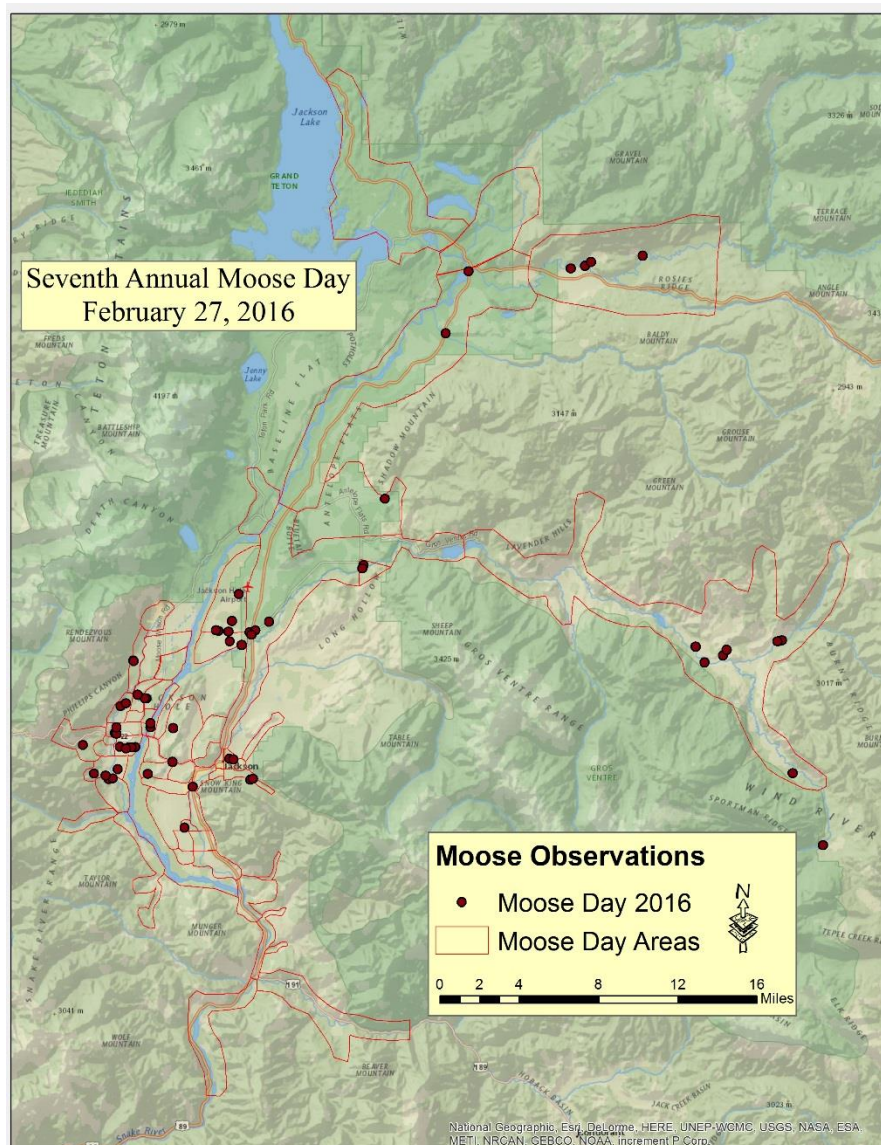


Figure 1. A total of 99 individual moose were observed during the sixth annual Moose Day 2016

In 2016, 73 individual people (38 people units) spent 259 total hours volunteering for a total effort of 108 hours (73 hours by car, 8 hours by foot and 19.5 hours by skis) (Table 4). Search effort was not recorded in 2009 or 2010. Search efforts for 2011 and 2012 were calculated based on the 2012 method. A more streamlined effort calculation was used in 2012 than in the 2011 report. This 2012 method more accurately represents the volunteers' effort covering the search areas rather than purely the hours volunteered. The 2012 method used "people units" rather than just the raw number of people.

Table 4. Numbers of people, hours volunteered and search effort on Moose Day from 2009-2016.

Year	People	People Units^a	Total Hours Volunteered^b	Total Effort^c
2009	57	-	-	-
2010	47	-	-	-
2011	46	31	137.5	88.8
2012	70	49	177.3	103.5
2013	80	40	291.45	132.45
2014	71	36	240.5	115.5
2015	71	39	214	108
2016	73	38	259	100.5

^a **People Units** represent the unit traveling together. For example, two people in one car represent one people unit and three people in one car also equate to one people unit.

^b **Total Hours Volunteered** is the sum of each team's number of people multiplied by the number of hours spent searching.

^c **Total Effort** represents the sum of each team's people units multiplied by the number of hours spent searching.

- The majority of volunteers worked in teams per our 2011 recommendation. This teamwork increased the number of volunteers involved and hopefully increased the observers' ability to spot moose especially given the poor visibility conditions this year.
- Volunteers continue to be enthusiastic with regard to the Moose Day project and express their appreciation and willingness to participate in systematic, focused projects.
- Again, this year volunteers gathered for lunch after the counting was complete to exchange stories and report in their observation numbers.
- In 2014-2016, we increased our training of sex and age identification by providing a Moose ID class the week prior to Moose Day. The training's are well attended and will continue to be offered prior to future Moose Days.

Recommendations:

- Continue to have all searching teams have a minimum of two observers, as it is often difficult to search and drive at the same time. In high snow years, the snow banks are at times higher than the vehicles thereby making a second set of observer eyes even more advantageous.
- Have observers document their search route and vantage points (2009 recommendation).
- A recommendation in 2012 was to plan a backup day in case of bad weather. This idea seems logistically very challenging and should be entered into with caution if at all.
- Moose Day 2017 is *tentatively* set for Saturday, February 25, 2016.