Moose Day Summary Report
4rd Annual - February 25, 2012

2012 marks the fourth 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 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 aeas), and contribute to tracking moose population trends in Jackson Hole over time.

In 2012, 58 areas of varying size were surveyed by 70 trained NMJH volunteer observers (including 11 4-H Wildlife Club members and adult chaperones working together as one team). One area, over Teton Pass, was modified due to inclement weather and poor driving conditions (only the lower portion up to Trail Creek Rd was covered). These observers dedicated a combined total of 177.3 volunteer hours searching.

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-four individual moose were observed in 2012 (Figure 1). Fewer moose were counted in 2012 than in 2011 but more than in 2010 (Table 1). Above average snow depth conditions in 2011 may have resulted in more moose moving to lower elevations and/or made moose more visible (see Weather Section below).

Table 1. Total moose observed during Moose Day from 2009-2012.

Year	Date	Total Moose Observed
2009	April 18	95
2010	February 27	86
2011	February 27	124
2012	February 25	94

(dates represent the last weekend of February)

Since 2009's survey was conducted in April, a direct comparison is not appropriate based on different moose habitat use between April and February. 2010 through 2012 were conducted in late February, thereby allowing for a comparison between years.

Weather:

Weather conditions were an incredibly windy and snowy day with poor to no visibility at times. Temperatures were in the twenties (20ºF in Jackson at 7:00 am). The Snake River Basin was at 88% of the 30-year average snow water equivalent as of March 29, 2012 (NRCS Snowtel 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.

Table 2. Snow water equivalent measurements and observer visibility scores from 2010-2012.

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

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 and observer visibility over the years could account for the varying numbers of moose observed. Variation in visibility conditions, such as in 2012 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 years 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 are being reworked slightly and renumbered for 2013. No areas with moose observations will be removed.

Summary:

- 58 individual search areas were covered by 70 volunteers
- 94 individual moose were observed
- 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 2012 by sex and age.

Sex/ Age	Adult	Yearling	Juvenile	Unknown	TOTAL
Female	18	0	0	2	20
Male	11	2	1	1	15
Unknown	3	2	5	49	59
TOTAL	32	4	6	52	94

In 2012, 70 individual people (49 people units) spent 177.3 total hours volunteering for a total effort of 103.5 hours (85.75 hours by car and 17.75 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 2009-2012.

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

[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 (photo below).
- In 2012, we increased our training of sex and age identification by developing a "Moose Identification Primer". Developing a resource such as this had been a recommendation since 2009. Many volunteers expressed that this training was very helpful and it should be continued in the future.

Volunteers Pictured: Back Row – Carolyn Nelson, Kevin Coughlin, Patty Ewing, Ralph Haberfeld, Louise Haberfeld, Morgan Graham, Aly Courtemanch, AJ DeRosa, John Freeze, Susan Marsh, Leith Barker;

Front Row (Left to Right) Rick Nelson, Embere Hall, Megan Smith, Jacob Freeze, Barbara Barker, Bobby Hughes. (Megan Smith, Courtesy Photo)

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.
- In 2012, moose observations from previous years were included on volunteer's field maps. This should be continued in future years.
- Have observers document their search route and vantage points (2009 recommendation).
- A new 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 2013 is *tentatively* set for Saturday, February 23, 2013.

Report:

Compiled by Megan A. Smith, Project Coordinator, Nature Mapping Jackson Hole/ Jackson Hole Wildlife Foundation, March 29, 2012.

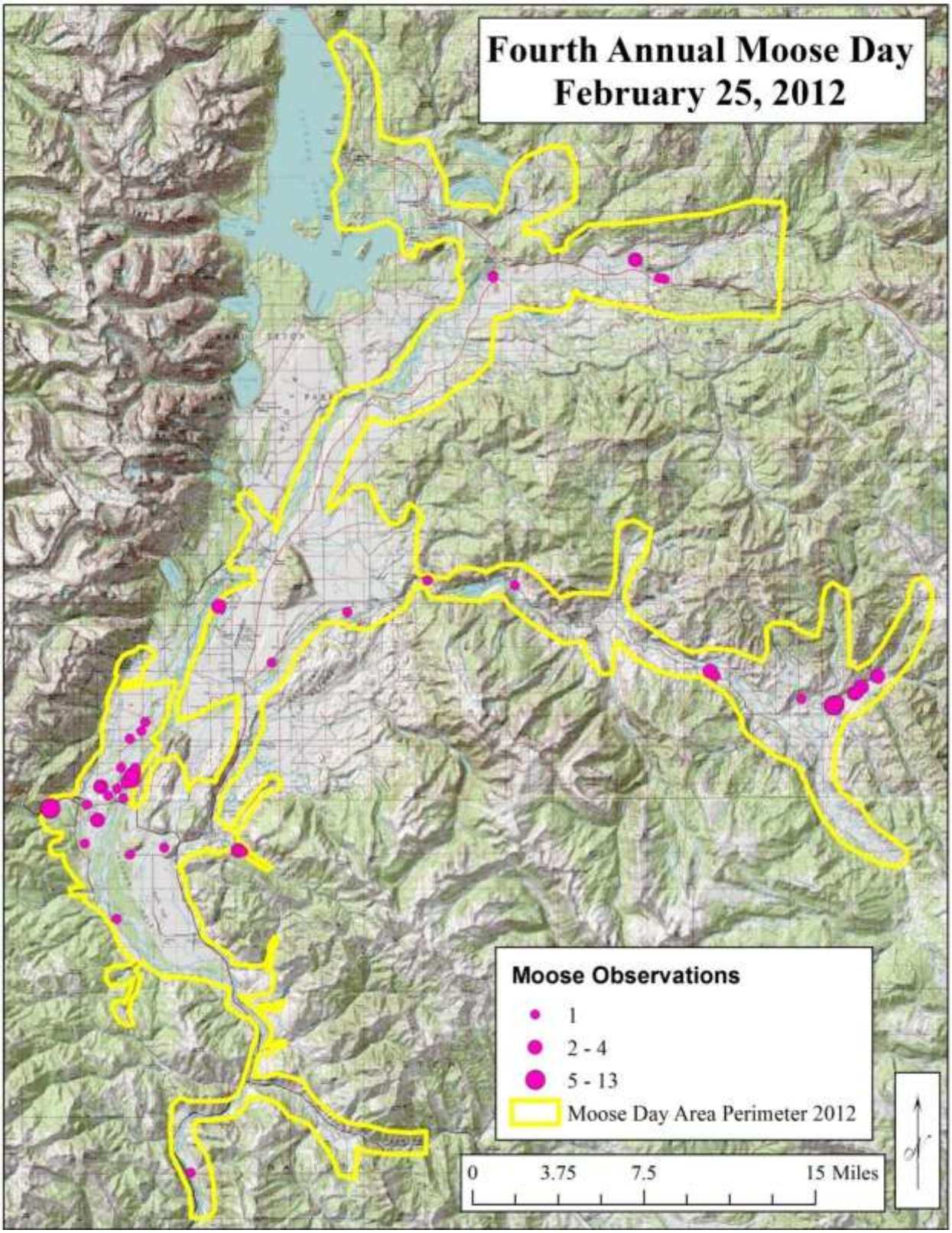

Figure 1. A total of 94 individual moose were observed during the fourth annual Moose Day 2012