

# Observations of Wolf and Deer During the Moose Survey 2010-2014.

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## Introduction

Each year, we conduct an aerial survey in northeastern Minnesota in an effort to monitor moose numbers (DeGiudice, 2014). While the objectives of this annual survey are to estimate moose numbers and demographic information, since 2010, wolf and deer observations have been recorded as part of this survey and are summarized in this report. Observations of deer and wolves were recorded in years prior to 2010, but with less consistency, and changes to the methodology of the moose survey in 2004 and 2005 render comparisons with earlier years more difficult.

## Methods

Moose survey plots are located across moose range in northeastern Minnesota (Figures 1-5). Since 2005 all moose survey plots have been rectangular (5 x 2.67 mi.) and oriented east to west with a total of 8 transect lines spaced 1/3 of a mile apart. Survey plots are stratified by expected moose density and are randomly selected. For the period of this report, the survey has been flown using 2 DNR Bell Jet Ranger (OH-58) helicopters. Transect lines are flown at an average of 250 feet above the ground at 58-63 miles per hour. In the OH-58s, the pilot is seated in the right front. One observer is seated in the left front, and one observer/recorder is seated in the rear directly behind the pilot. In 2010, data were recorded on paper sheets. The program DNRSurvey, on Toughbook® tablet style computers, was used to record survey data for the period of 2011-2014 and provides real time location information.

Deer are tallied as they are observed incidentally on the survey plots by the pilot or either observer. Although effort is made not to double count deer, no extra effort is made to determine sex or age of deer or to verify if more deer were present than first observed. Locations of deer are not recorded except with reference to the survey plot.

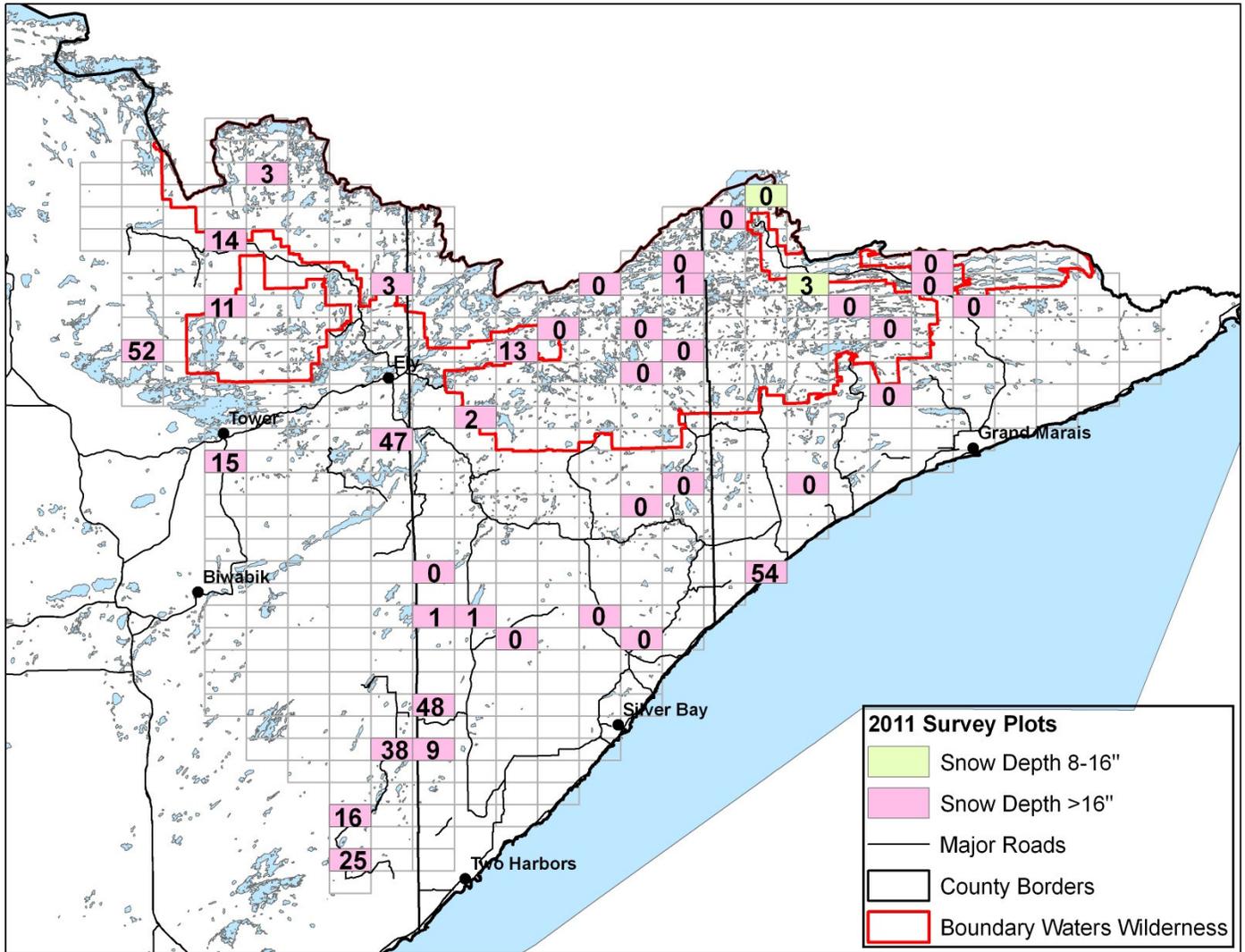
Locations of wolf observations are recorded using DNRSurvey. In addition to wolves, observations of deer and moose carcasses judged to be wolf-kills are also recorded. Observations of wolves and carcasses have been recorded consistently on survey plots since 2010, but with less consistency as they are encountered outside of survey plots. Observations of wolf tracks are not recorded except once per survey plot if encountered during years when the Minnesota DNR is conducting statewide wolf population and range estimates. The last moose survey when wolf tracks were recorded was 2013.

Estimates of snow depth are done by a combination of aerial observation and local knowledge of snow measurements. Snow depth estimates are recorded at the time the plot is flown.



## 2011 Survey

In 2011 a total of 40 moose survey plots were flown during 5-19 January and 356 deer were observed. Forty-eight percent of survey plots were occupied by 1 or more deer. On plots occupied by 1 or more deer, deer numbers averaged 19 per plot (range = 1-54). The locations of moose survey plots and the number of deer observed on each plot are shown in Figure 2.



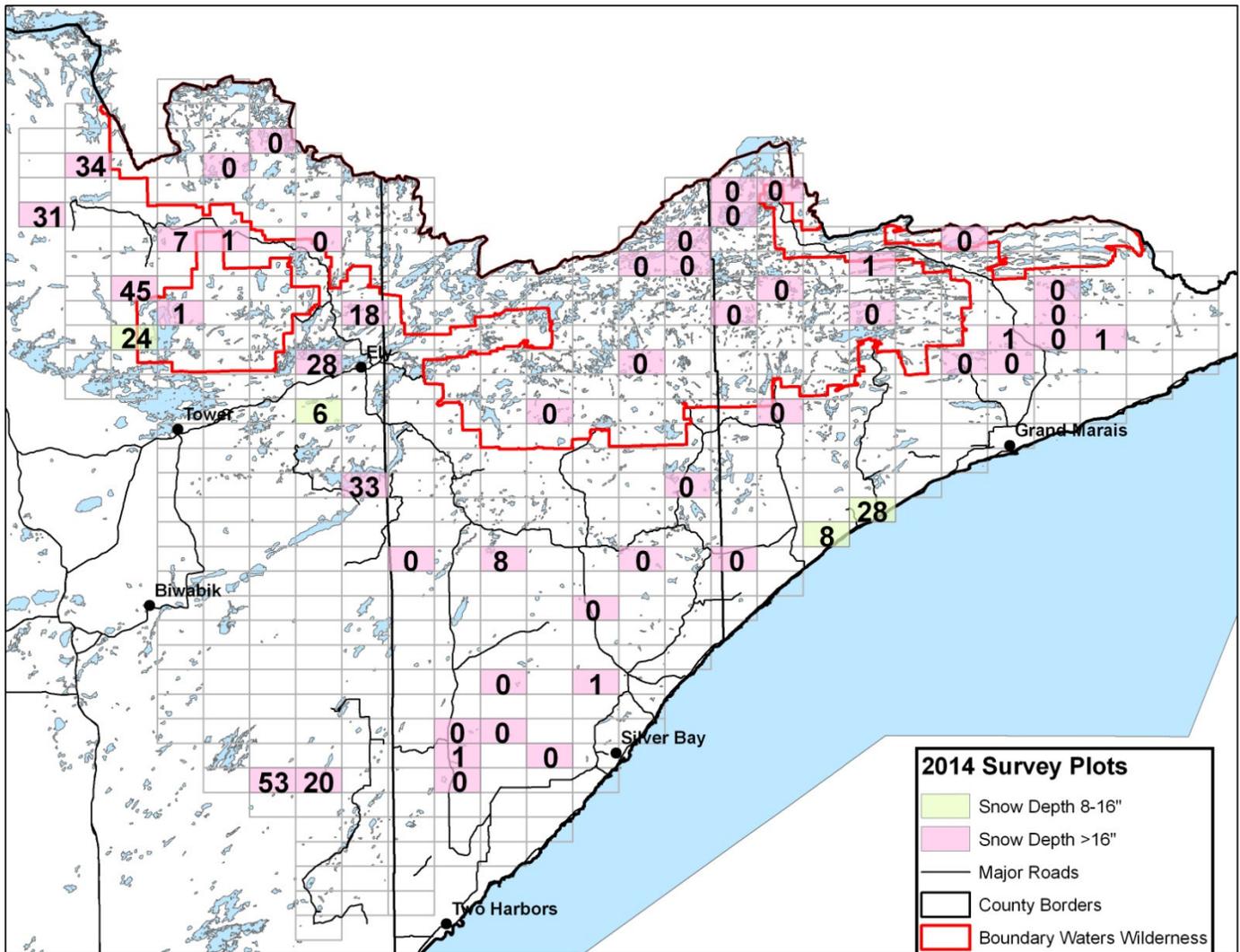
**Figure 2.** Deer observations on moose survey plots, 5-19 January 2011.





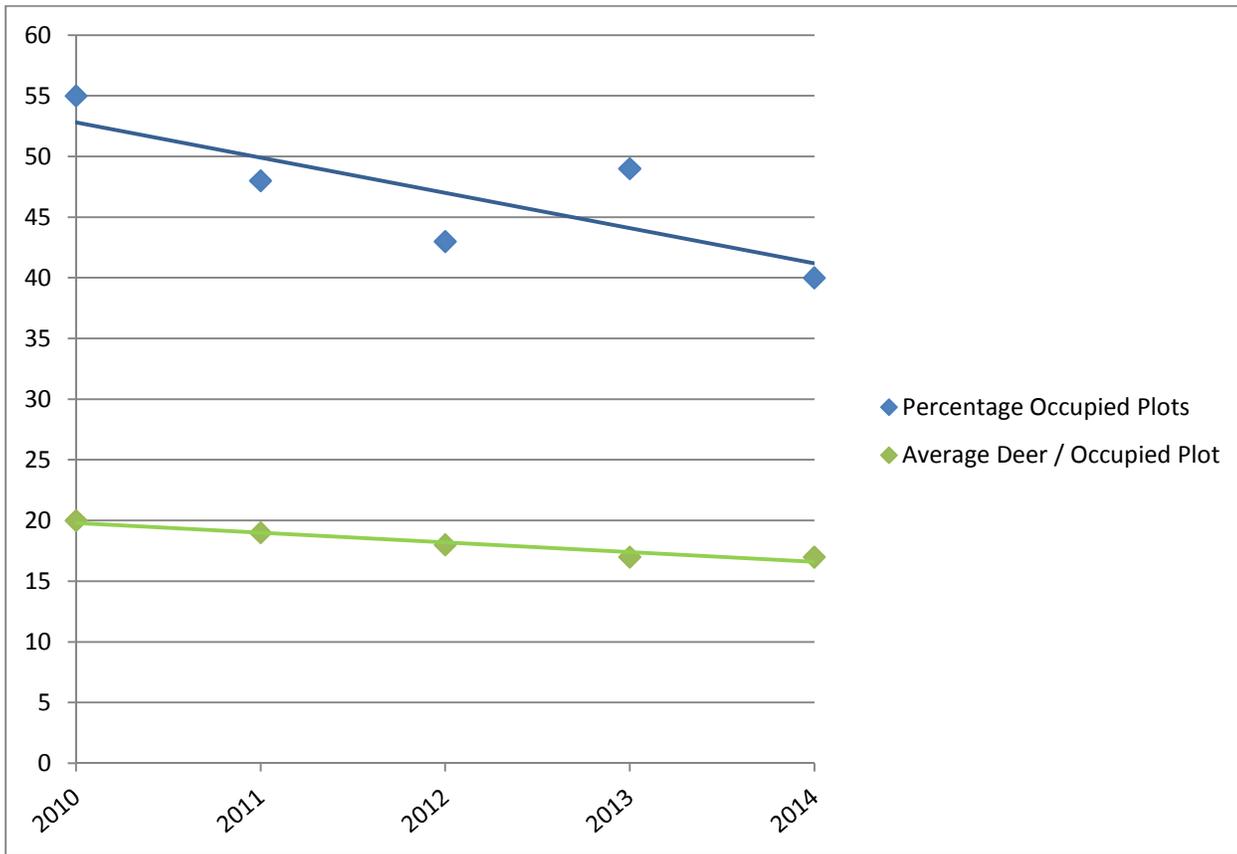
## 2014 Survey

In 2014 a total of 52 moose survey plots were flown during 7-18 January and 350 deer were observed. Forty percent of survey plots were occupied by 1 or more deer. On plots occupied by 1 or more deer, deer numbers averaged 17 per plot (range = 1–53). The locations of moose survey plots and the number of deer observed on each plot are shown in Figure 5.



**Figure 5.** Deer observations on moose survey plots 7–18 January 2014.

There has been a slow but steady decline in the average numbers of deer per occupied survey plot since 2010 (Figure 6). Generally, the trend in the percentage of moose survey plots occupied by deer also has been down; however, this metric may be somewhat influenced by snow depths at the time of the survey. Across all years, a geographic distribution of deer is evident with the majority seen along the western edge of moose range and along the shore of Lake Superior. Smaller numbers of deer are regularly observed in the Isabella area and near Poplar Lake along the Gunflint Trail. These last two concentrations are believed to be the result of local deer feeding efforts.



**Figure 6.** Trends in percent of moose survey plots occupied by deer and average deer numbers per occupied plot.

### Wolf Observation Results

All of the moose range in northeast Minnesota is considered occupied wolf range (Erb and Sampson 2013). In 2014, 52 survey plots totaling 694 mile<sup>2</sup> were flown. Three wolves were spotted together on moose survey plot 41 by Trout Lake in the BWCA and 6 wolves were observed together on Nawakwa Lake in the BWCA just outside one of the survey plots. Pack observations represent minimum pack size as some animals may have been missed. Considering only observations of 2 or more wolves, the average minimum pack size observed from 2010-2014 has been 4.

In addition, one deer carcass was observed in 2014 on moose survey plot 160 near Low Lake north of Ely. Carcass observations are of deer or moose that appear to be wolf-kills based on the judgment of the survey crew. However, these judgments are somewhat subjective. Research on moose in Minnesota indicates some moose die from other causes and are merely scavenged by wolves. Wolf and wolf-kill observations are summarized in Table 1.

Survey Year	2010	2011	2012	2013	2014
Number of wolf sighting events	3	2	2	4	2
Total wolves seen	19	4	4	14	9
Range of group sizes observed	5-8	1-3	1-3	2-6	3-6
Number of deer carcasses	3	0	0	1	1
Number of moose carcasses	1	0	1	2	0

**Table 1.** Summary of wolf and wolf-kill observations during moose surveys from 2010-2014.

### Acknowledgments

Funding for the moose survey was provided by the Fond du Lac Band of Lake Superior Chippewa; an Environmental Protection Agency, Great Lakes Restoration Initiative Tribal Capacity Grant; the 1854 Treaty Authority; and the Minnesota Department of Natural Resources. DNRSurvey software support was provided by Robert Wright with Minnesota IT Services. From 2010-2013 several different tribal, DNR Wildlife and DNR pilots participated in the survey. In 2014 deer and wolf observation data were collected with the assistance of DNR Area Wildlife staff Tom Rusch and Nancy Hansen, 1854 Treaty Authority Resource Management Division Director Andy Edwards and DNR pilots John Heineman and Brad Maas.



**Figure 7.** Wolves on the ice of Nawakwa Lake, 15 January 2014. Photo by Andy Edwards.

### Literature Cited

- DelGiudice, G.D. 2014. 2014 Aerial Moose Survey. Minnesota Department of Natural Resources, St. Paul.
- Erb, J., and B. Sampson. 2013. Distribution and Abundance of Wolves in Minnesota, 2012-13. Minnesota Department of Natural Resources, St. Paul.