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Title **Spotlight Survey Results**

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Spotlight Survey Results

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Purpose: Spotlight surveys were conducted during FY2000–FY2003 as a monitoring technique to detect trends in population sizes of medium and large mammals on Los Alamos National Laboratory (LANL). Surveys were discontinued in FY2004.

Methods: Spotlight surveys were conducted as transects along paved and dirt roads on the interior of LANL property. Each survey crew consisted of at least one driver and two spotlighters. Spotlight surveys are conducted from pickup trucks traveling at approximately 5 mph. See Hazard Control Plan LANL-RRES-ECO-NRM-HCP/OP-002 for further details on the survey procedure.

When an animal or group of animals was sighted, data were recorded on the species, number of animals in the group, distance from vehicle, angle from the transect line, sex and age, and mileage from beginning of transect line. An index to the abundance of the species was calculated as numbers seen per kilometer traveled. All transects were repeated on four consecutive nights (weather permitting) twice a year (in February and July) and an average abundance index value was calculated for each species in each season. We use approximately 27 km of routes that cover most of LANL. Figure 1 shows the locations of these routes.

Results: As of July 2003, we had four years of winter data and four years of summer data (Appendix). The most abundant animals seen during spotlight surveys were Rocky Mountain elk, mule deer, and cottontail rabbits. Other animals occasionally seen have included grey fox, bobcat, and coyote.

Rocky Mountain elk occur on LANL year-round. However, the greatest short-term impact on elk numbers appeared to be the movement of migratory elk onto LANL during winters with deep snow cover. The peak in abundance of elk during February 2001 (Figure 2) documents an up to 10-fold increase in the abundance of elk wintering on LANL in a wet winter versus the drier winters of 2000, 2002, and 2003. The abundance of elk detected during February surveys was highly correlated with the total January snowfall for that year, measured at the TA-6 meteorological station ($r^2 = 0.996$, $p = 0.004$). During 2000–2003 we saw a consistent increase each year in the abundance indices of resident elk in the summer surveys.

January Snowfall from 2000 to 2003

2000	2001	2002	2003
1.2 inches	35.2 inches	8.4 inches	0 inches

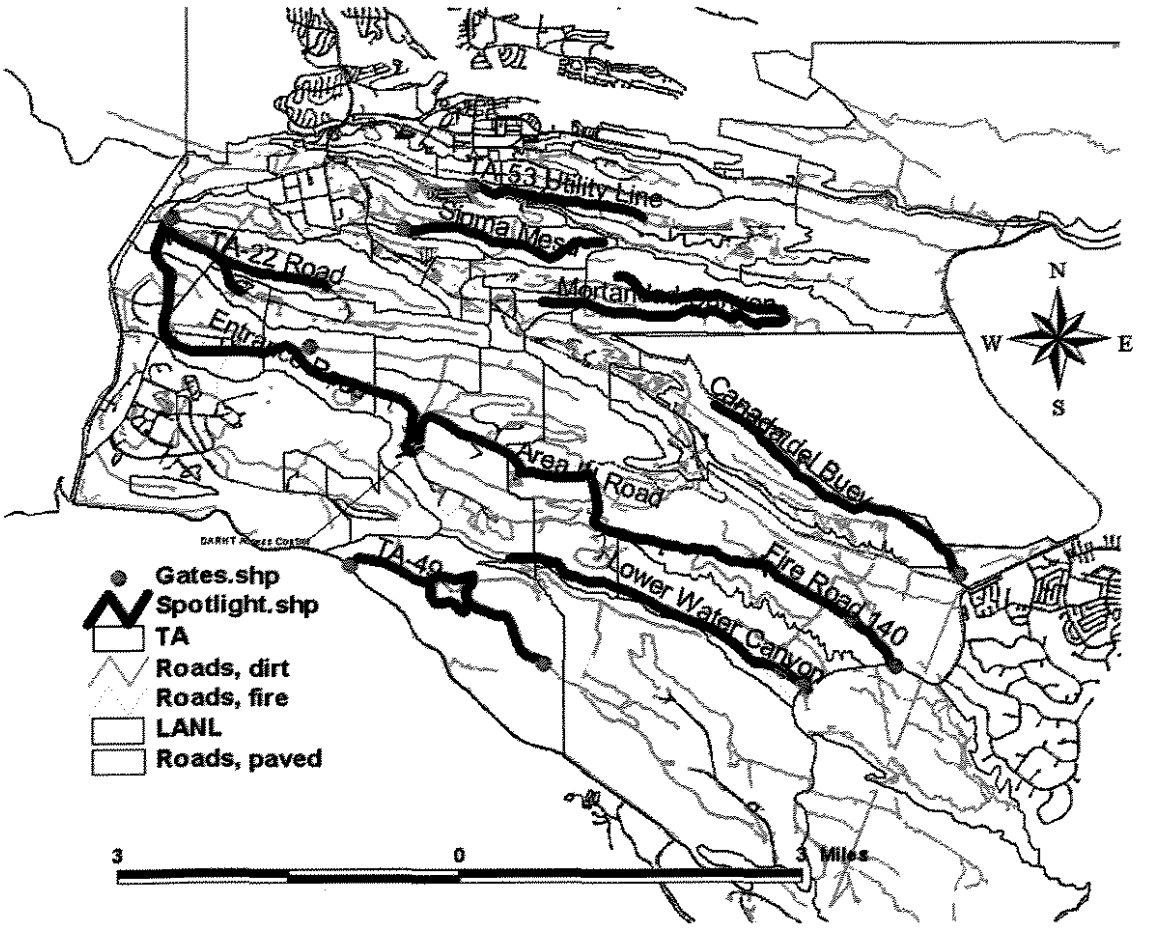

Figure 1. Location of spotlight survey routes at Los Alamos National Laboratory.

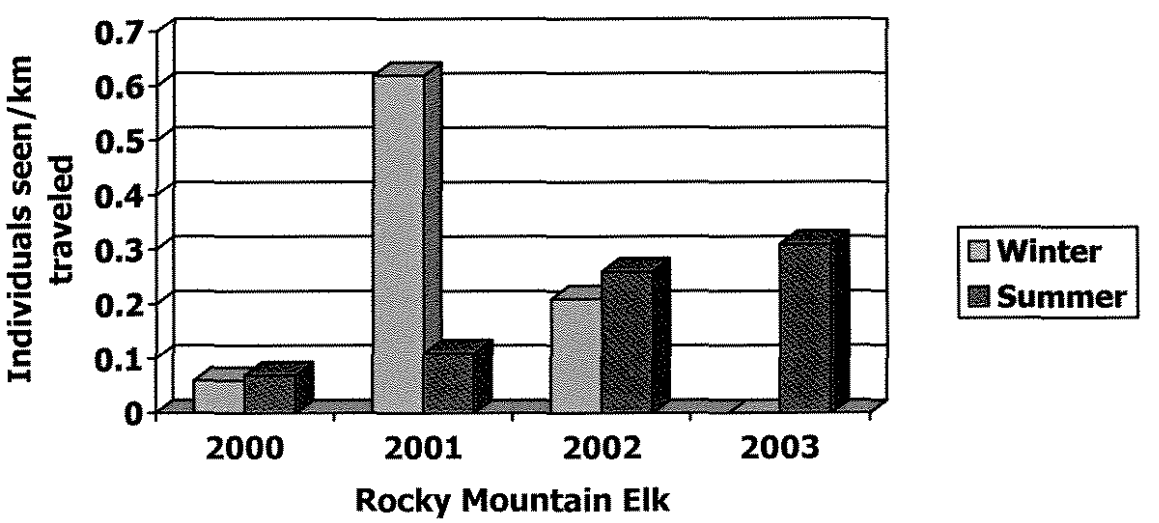

Figure 2. Average number of elk seen per km traveled at Los Alamos National Laboratory, February 2000–2003 and July 2000–2003.

Appendix: Results of Wildlife Spotlight Surveys

Elk

February 2000

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
2/14/2000	1	2	0.03	0.05
2/15/2000	3	4	0.08	0.10
2/16/2000	0	0	0.00	0.00
2/17/2000	2	3	0.05	0.07
		Average	0.04	0.06
		CV	85.76	113.45

February 2001

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
2/12/2001	7	22	0.22	0.70
2/13/2001	2	3	0.06	0.08
2/14/2001	7	41	0.20	1.14
2/15/2001	2	20	0.06	0.56
		Average	0.13	0.62
		CV	67.20	330.40

February 2002

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
2/11/2002	1	1	0.02	0.02
2/12/2002	1	1	0.02	0.02
2/13/2002	2	7	0.05	0.18
2/14/2002	1	25	0.02	0.59
		Average	0.03	0.21
		CV	43.28	861.79

February 2003

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
2/10/2003	0	0	0.00	0.00
2/11/2003	0	0	0.00	0.00
2/12/2003	0	0	0.00	0.00
		Average	0.00	0.00
		CV		

July 2000

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
7/17/2000	2	4	0.05	0.10
7/18/2000	1	2	0.02	0.05
7/19/2000	2	3	0.05	0.07
7/20/2000	2	2	0.05	0.05
		Average	0.04	0.07
		CV	27.62	57.16

July 2001

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
7/16/2001	0	0	0.00	0.00
7/17/2001	0	0	0.00	0.00
7/18/2001	2	4	0.05	0.09
7/19/2001	4	15	0.09	0.34
		Average	0.03	0.11
		CV	127.66	472.58

July 2002

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
7/22/2002	4	27	0.09	0.60
7/23/2002	1	1	0.02	0.02
7/24/2002	3	15	0.06	0.32
7/25/2002	3	4	0.07	0.09
		Average	0.06	0.26
		CV	46.65	433.58

July 2003

Date	No. of Groups	No. of Individuals	Groups seen/km travelled	Individuals seen/km travelled
7/28/2003	2	13	0.04	0.29
7/29/2003	1	9	0.02	0.20
7/30/2003	6	18	0.13	0.40
7/31/2003	5	16	0.11	0.35
		Average	0.08	0.31
		CV	68.01	111.88