



FINAL REPORT  
15 October 2001

**CARIBOU SURVEYS FROM GRAVEL ROADS AND PADS IN THE  
MILNE POINT, KUPARUK, AND PRUDHOE BAY OILFIELDS,  
ALASKA, JUNE 2000**



Prepared for

**BP EXPLORATION (ALASKA) INC.**  
Environmental Studies Group  
P.O. Box 196612  
Anchorage, Alaska 99519-6612



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Prepared by

Shawn P. Haskell

**LGL ALASKA RESEARCH ASSOCIATES, INC.**  
1101 East 76<sup>th</sup> Avenue, Suite B  
Anchorage, Alaska 99518

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## ABSTRACT

From 15 June through 29 June 2000, ground surveys of caribou (*Rangifer tarandus*) were conducted along roads in the Milne Point and Kuparuk oilfields, and along the Spine Road from the Milne Point Road east to, and including Prudhoe Bay Unit Z-pad. I determined locations and compositions of 472 caribou groups  $\leq 1$  km from active gravel roads and production pads. Caribou behavior within the study area, and distribution beyond the study area, were observed. I counted 13,327 caribou, including 1,826 calves within the study area. Distance of groups with  $\geq 1$  calf averaged 653 m (range 0–950 m,  $n=35$ ) from roads and pads during the calving period and 376 m (range 0–960 m,  $n=123$ ) during the post-calving period. Distance of groups without calves averaged 327 m (range 0–970 m,  $n=75$ ) from roads and pads during the calving period and 232 m (range 0–980 m,  $n=239$ ) during the post-calving period. I grouped observations in 200 m intervals (0–200, 201–400, 401–600, 601–800, 801–1000) from roads and pads and observed 4, 7, 24, 20, and 41 calves, within these respective intervals, during the calving period. During the post-calving period, I observed 662, 437, 170, 279, and 182 calves within the same intervals. Positions for all 4 calves sighted in the nearest interval during calving and 338 of the calves sighted in the nearest interval during post-calving, were recorded on roads.

**Keywords:** calves, calving period, distribution, disturbance, post-calving period

## INTRODUCTION

The effect of Alaska's North Slope oilfields on barren ground caribou (*Rangifer tarandus granti*) has been the subject of extensive research and monitoring over the past thirty years. Several authors have suggested that oilfield development has resulted in shifts in distribution of calving caribou, thereby decreasing nutritional status and reproductive performance (Dau and Cameron 1986b; Cameron et al. 1992, 1995; Nelleman and Cameron 1996, 1998). However, the Central Arctic Herd has increased in numbers since oilfield development began on the North Slope, and regularly use habitats in the oilfields (Cronin et al. 1994, 1995, 1997, 1998a, 1998b; Ballard and Cronin 1995; Pollard et al. 1996a, 1996b; Noel et al. 1998; Ballard et al. 2000).

There are two calving areas of the Central Arctic Herd (CAH): (1) the Kuparuk-Milne Point area between the Colville and Kuparuk rivers west of Prudhoe Bay, and (2) the Bullen-Staines area between the Shaviovik and Canning rivers east of Prudhoe Bay (Curatolo and Reges 1984, Lawhead and Cameron 1988). Pre- and post-development data in the Milne Point and Kuparuk oilfields suggest that most of the cow caribou with calves occur >4 km from roads during calving (Dau and Cameron 1986b, Cameron et al. 1992). However, distribution relative to infrastructure is quite variable and calves are frequently within 1-4 km of roads (Olson and Noel 2000). In recent years, a large proportion of the calving has occurred approximately 7 to 27 km south of the Kuparuk oilfield (Lawhead and Cameron 1988; Lawhead et al. 1994; Nellemann and Cameron 1996, 1998; Lawhead 1997; Lawhead and Johnson 2000; Wolfe 2000). It has been hypothesized that this is a range shift resulting from oilfield development.

Aerial surveys have been conducted in the Milne Point, Kuparuk, and Prudhoe Bay oilfields and undeveloped areas during calving and post-calving periods (Lawhead and Curatolo 1984, Dau and Cameron 1986a, Lawhead and Cameron 1988, Johnson and Lawhead 1989, Cameron et al. 1992, Lawhead and Flint 1993, Lawhead et al. 1994, Pollard and Noel 1994, Noel 1996, Pollard et al. 1996b, Lawhead et al. 1997, Noel 1997, Lawhead et al. 1998, Noel and Olson 1999, Lawhead and Johnson 2000, Olson and Noel 2000, Demarchi et al. 2001). These surveys describe the number and distribution of caribou across a broad area of Alaska's Arctic Coastal Plain.

In this study, I focused on the fine-scale distribution of caribou near oilfield roads and pads. Our objective was to assess caribou numbers and distribution within 1 km of active gravel roads and pads in the Milne Point and Kuparuk oilfields, by daily observation during the calving and post-calving periods. BP Exploration (Alaska) Inc. (BPXA) funded this study as a research project to aid in the management of caribou and oilfields, not as a permit requirement or under request of a regulatory agency.

## STUDY AREA

The study area was located on the northern edge of Alaska's Arctic Coastal Plain between lat 70°10'N and 70°30'N, and between long 149°10'W and 150°20'W. Most of the study area is dominated by wet and moist graminoid tundra, characterized by low relief and many shallow lakes (Walker et al. 1980). Southwest of the Kuparuk oilfield, the elevation rises slightly and the dominant land cover becomes moist sedge and tussock tundra (Johnson et al. 1998). Hills emerge in the Tarn development area near the western terminus of the Spine Road.

The study area included the Prudhoe Bay Unit Z-Pad on the east to the Tarn development DS-2N on the west, and all areas within 1 km of gravel roads and pads accessible to a pick-up truck. The Spine Road is the main travel corridor from east to west. The Milne Point and Oliktok roads both lead north to the Beaufort Sea coast. There are 32 secondary roads leading to production pads and mine sites (Figure 1).

## METHODS

I documented caribou locations  $\leq 1$  km from roads and drill pads within the Milne Point and Kuparuk oil development areas, 15-29 June 2000. Observations were made from a pick-up truck using a window-mounted spotting scope and 10X42 binoculars. Sightability was reduced at times due to topographical relief and heat waves emanating from the tundra. Vantage points such as well-houses, elevated spots on roads, snow banks, gravel piles, stairs, and the truck bed were used to optimize observations. After the fourth day of the study, 19 June, observing from the tops of well-houses on pads was disallowed.

I determined locations of caribou groups by recording the observer's location [with a Garmin® Olathe, KS, USA, 12XL Geographical Positioning System (GPS)] and estimating the

distance (with a Laser Technology Inc.® Englewood, CO, USA, Impulse XL laser range finder) and direction (determined with a compass) to the center of each caribou group. Typically, distances for caribou groups >700 m away were visually estimated after using the range finder to determine the distance to landmarks (e.g., power poles, pingoes, etc.) in close proximity to the groups. A minimum distance from roads was estimated for groups of caribou that were moving. Offsets from the observer's location to that of a caribou group were determined by a geometric equation using UTM coordinates, and the actual distance to infrastructure measured using MapInfo® Professional 4.5 GIS program (MapInfo Corporation® Troy, New York, USA).

No observations were made in the afternoons following the third day, 17 June, because of difficulty seeing through heat radiation. Thereafter, observations were mostly made between 20:00 and 12:00. During the first 4 days of study, 1 observer spent >40 hours to cover the entire study area. After the fourth day of observation, 2 observers worked separately and covered a total of approximately two-thirds of the study area per day.

For all caribou groups except 2 large groups, I recorded the exact numbers and composition of visible animals. For the other 2 groups, CAH248 and CAH249, along the Milne Point Road, 26 June, a sample composition was obtained for approximately 150 animals per group and then extrapolated in proportion to the estimated group size. I attempted to record an animal only once per day of observation by completing surveys of both roadsides while traveling in only one direction.

In previous studies, calving and post-calving periods are treated separately and 20 June has been the somewhat arbitrary date separating these periods (Wolfe 2000). Calving of the Central Arctic Herd typically occurs at the end of May, peaks during the first week of June, and is complete by 15 June (Pollard et al. 1992). Postpartum caribou are sensitive to disturbance and have been reported to avoid roads and gravel pads with human activity for up to three weeks after birthing (Dau and Cameron 1986a, Cameron et al. 1992). A late break-up (spring thaw) on the North Slope this spring 2000, hindered northbound movements of migratory animals, causing caribou calving to occur later than usual and to be more dispersed than is typical of the Arctic herds (E. Lenart, ADF&G, pers. comm.). Caribou calves at various stages of physical development were observed throughout the study. Following a period of warm and sunny



weather, caribou activity increased on 22 June, coinciding with an observed increase in insect activity. Therefore, I considered the calving period this year to extend until late morning 22 June, between observation days 7 and 8 (Appendix A), when caribou behavior became altered due to insect harassment.

## RESULTS

I observed 13,327 caribou in 472 groups, 15–29 June 2000, after 178.25 hours of observation (Table 1, Appendix A). I observed 543 caribou during the calving period and 12,784 caribou during the post-calving period (Table 1). Average group size consisted of 4.9 caribou during the calving period and 35.3 caribou during the post-calving period (Table 1). The number of caribou observed per hour of observation was lower during the calving period (6.8) than the post-calving period (130.1) (Table 1). The number of calves observed was also lower during the calving period ( $n=96$ ; 1.2 per hour) than the post-calving period ( $n=1730$ ; 17.6 per hour) (Table 1). The average size of groups with  $\geq 1$  calf present was 9.3 animals during calving and 91.3 animals during post-calving (Table 2, Figure 4). The average size of groups with no calves present was 2.9 animals during calving and 6.5 animals during post-calving (Table 2, Figure 4).

During the calving period, the distance of groups with and without calves from roads and pads averaged 653 m ( $n=35$ ) and 327 m ( $n=75$ ), respectively (Table 2). During the post-calving period, the distance of groups with and without calves from roads and pads averaged 376 m ( $n=123$ ) and 232 m ( $n=239$ ), respectively (Table 2). The average distance from roads and pads was 316 m ( $n=472$ ) for all groups observed during the study (Table 2).

Overall, during the calving period, groups of caribou with calves were farther from roads and pads than were groups without calves (Table 2, Figure 4). Of the 35 groups with  $\geq 1$  calf present, I observed 3%, 17%, 14%, 29%, and 37% in the 0–200, 201–400, 401–600, 601–800, and 801–1000 intervals, respectively. Caribou without calves were closer to roads. Of the 75 groups without calves, I found 43%, 21%, 16%, 11%, and 9% to be in the same respective intervals (Table 2, Figure 4).

During the first three days of observation, at least 1 calf was present in 16 of 27 (59%) caribou groups. Thereafter, the percentage of groups with a calf present quickly declined

(Table 1). Of the 148 animals counted in the first 27 groups observed, 69% were classified as cows, 31% as calves, and 0% as bulls. The first pair of bulls was observed on 19 June (Appendix A). During the first 3 days, cow/calf pairs represented 88 of the 148 animals (59%) counted and a greater proportion of the composition of caribou than at any other time period (Table 1).

During the post-calving period, most groups with and without calves were located within 400 m of roads and pads (Table 2, Figure 5). Of the 123 groups with  $\geq 1$  calf present, I observed 37%, 22%, 16%, 14%, and 11% in the 0–200, 201–400, 401–600, 601–800, and 801–1000 intervals, respectively. Of the 239 groups without calves, I found 59%, 22%, 8%, 8%, and 3% to be in the same respective intervals (Table 2, Figure 5). Many of these groups were traveling through the oilfields often crossing, or on, roads (Table 2, Figure 5).

## DISCUSSION

Caribou were relatively sedentary during calving, and groups were generally small (Tables 1 and 2, Figures 4 and 6, Appendix A). It appeared that groups of bulls, or cows without calves, were more mobile and closer to roads than groups with calves. They may have been attracted to roadside vegetation. Snow cover was not measured during this study but was observed by the author to be  $\geq 50\%$  in the study area on the first day of the study during a period of rapid melting. After warm weather (approximately 50 °F) and minimal cloud cover quickly melted the snow, mosquitoes began to emerge around 22 June. Caribou began to congregate in larger groups in the study area, as several hundred began to move into the Kuparuk oilfield and along the Spine Road from the south and west (Figure 7). Large groups were more likely to have a calf present. Caribou harassment by insects did not become severe until the evening of 24 June, continuing through the afternoon of 26 June. During this time, large groups were observed moving to the northeast towards coastal insect relief habitat. Several of these groups were traveling along or crossing the Spine Road and Milne Point Road (Figure 8, Appendix A). After insect activity decreased on 26 June, many groups with and without calves remained feeding and resting in areas 100 to 400 m from roads and pads without apparent distress.

Vegetation and landforms such as tussocks and small pingoes can obscure resting caribou, especially calves, and identifying prone calves up to 1 km away by ground observation can be

difficult. Detection depends primarily on topography and group/individual activity (e.g., resting, feeding, or moving). Optimizing light/observing conditions, elevating the observer's position, and observing during periods of high caribou group activity and for extended periods of time may facilitate the process. I am unsure of how many calves remained undetected during our observations; our count of calves is probably lower than the number actually present. Another difficulty encountered was differentiating between females and young males, especially yearlings. Visual identification of reproductive organs can be the only method of determination. Again, this is made easier when caribou are moving and genitalia are readily visible. Our count of cows may be artificially high because many young males may have been counted as cows.

Throughout the study, caribou distribution could have been influenced by the presence of grizzly bears. One sow with three cubs was observed in the Milne Point and Kuparuk oilfields (Figures 6 and 7). Perhaps two different lone boars were also observed. One was sleeping northeast of Kuparuk Mine Site E (Figure 6), and a boar with tagged ears was observed twice in the southwestern CPF-3 section of Kuparuk (Figures 6 and 7). This bear was observed on the evening of 16 June, Day 2, while feeding on what appeared to be the carcass of a caribou calf. Also, a sow with one cub was sighted in the area between Kuparuk's CPF-1 and CPF-2, south of the Spine Road (Figure 7).

Caribou continue to calve in historical use areas north of the Spine Road despite the extensive oil development in the vicinity over the past 20 years (Lawhead and Johnson 2000, Olson and Noel 2000). Concerns have been raised that a small proportion of the herd calves north of the Spine Road and a larger proportion calve to the south and west. Information regarding the distribution of calving caribou in this area is minimal prior to 1978 and most of the oilfield developments (Murphy and Lawhead 2000). However, as many as 2,458 caribou, including calves, were estimated to be present in the Kuparuk and Milne Point oilfields on 11 June 1996 (Johnson et al. 1997). This number is nearly equivalent to the entire estimated herd size in the late 1960s and early 1970s, although no accurate counts are available (Gavin 1972, Murphy and Lawhead 2000, B. Hilliker pers. comm.).

On 12 June 2000, an aerial survey encompassing nearly all of our study area east of Oliktok Road documented only 17 caribou, including 4 calves, in the eastern Kuparuk and Milne Point

oilfields (Demarchi et al. 2001). During initial coverage of our study area east of Oliktok Road, 15–18 June 2000, I observed a total of 31 caribou, including 8 calves. Additional caribou groups consisting of 89 individuals, were also observed >1 km from roads in this area from 15–18 June 2000. In spring 2000, caribou arrived late to the oilfields, but became present in large numbers by the end of June. This late arrival is most likely the result of delayed snowmelt.

## **CONCLUSIONS**

During this study, parturient cows, postpartum cows with calves, barren cows, yearlings, and bulls of the Central Arctic Caribou Herd utilized habitat within 1 km of active oilfield gravel roads and pads for calving, feeding, resting, and moving during calving and post-calving periods on Alaska's North Slope.

During the calving period, groups of caribou without calves were generally found closer to roads and pads than were groups with calves. Of the 75 groups without calves, 48 (64%) were within 400 m of roads and pads, while 8 of 35 groups (23%) with  $\geq 1$  calf were within 400 m of roads and pads.

During the post-calving period, the majority of caribou groups both with and without calves were found relatively close to roads and pads. Of the 239 groups without calves, 194 (81%) were within 400 m of roads and pads, and 72 of 123 groups (59%) with  $\geq 1$  calf were within 400 m of roads and pads.

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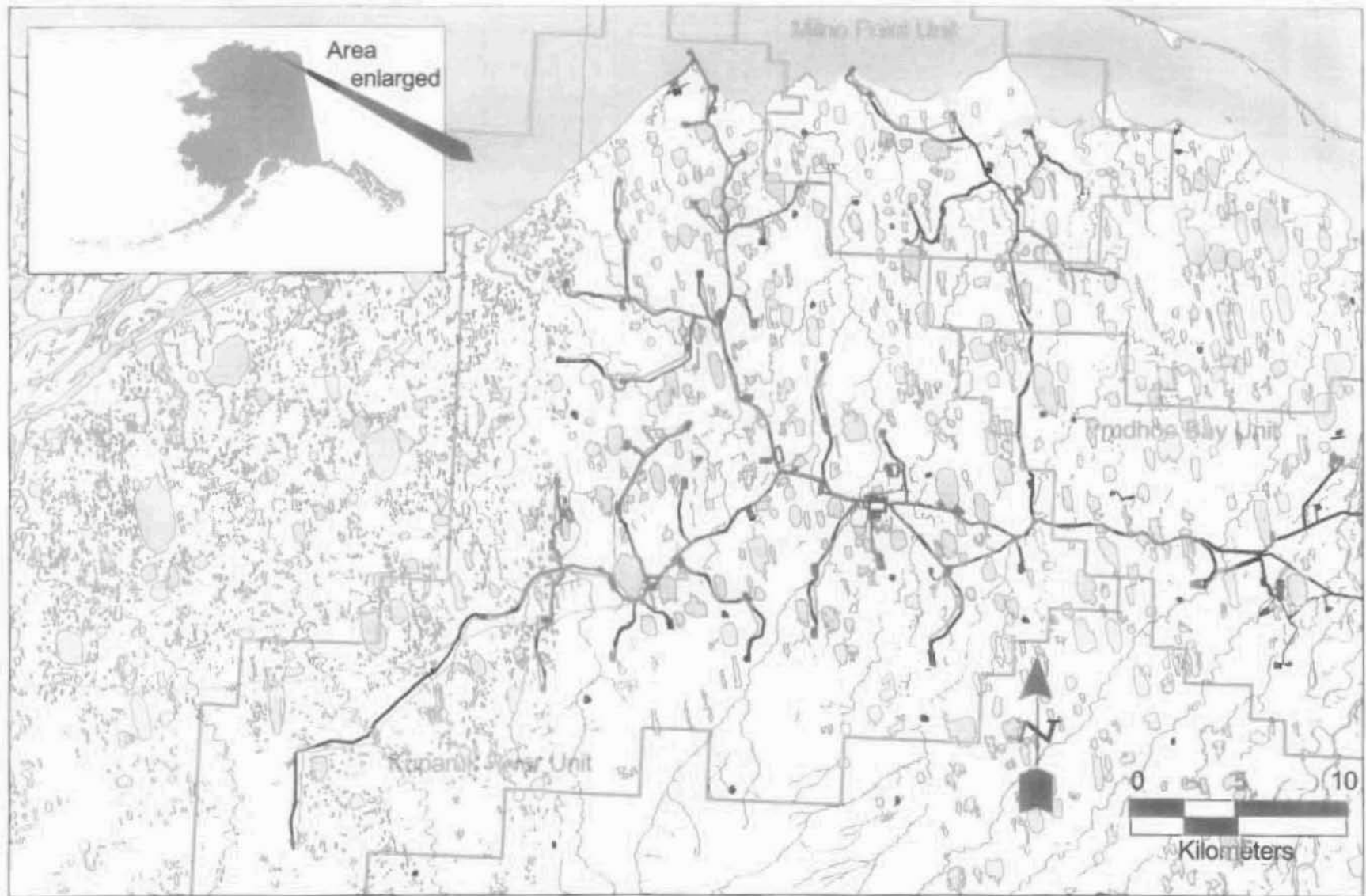


Figure 1. Area within 1 km of gravel roads and pads in the Milne Point, Kuparuk, and Prudhoe Bay oilfields, Alaska, surveyed for caribou, June 2000.

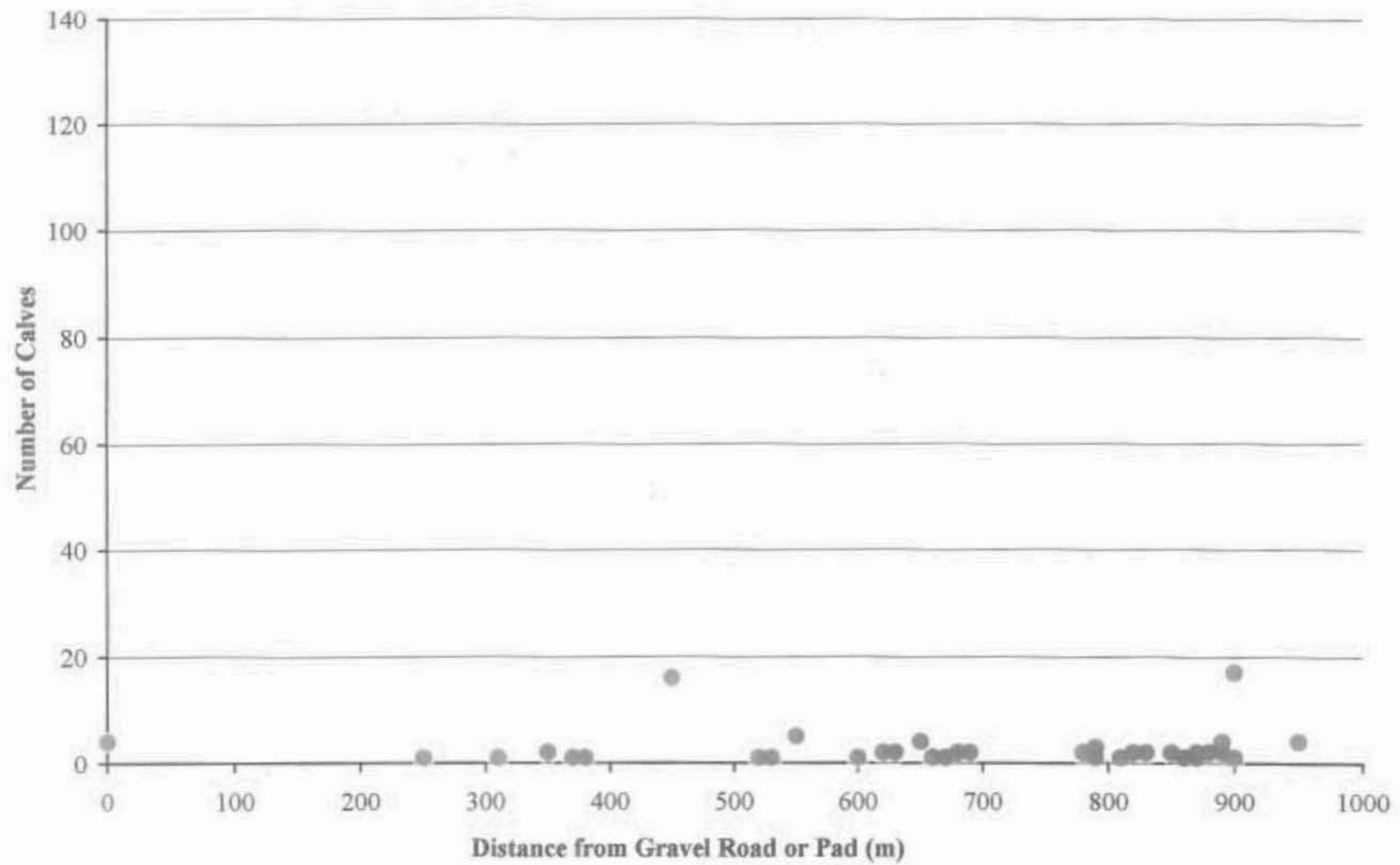


Figure 2. Calf distribution among groups as observed from roads during the calving period, 5–22 June 2000 ( $n = 35$ ).

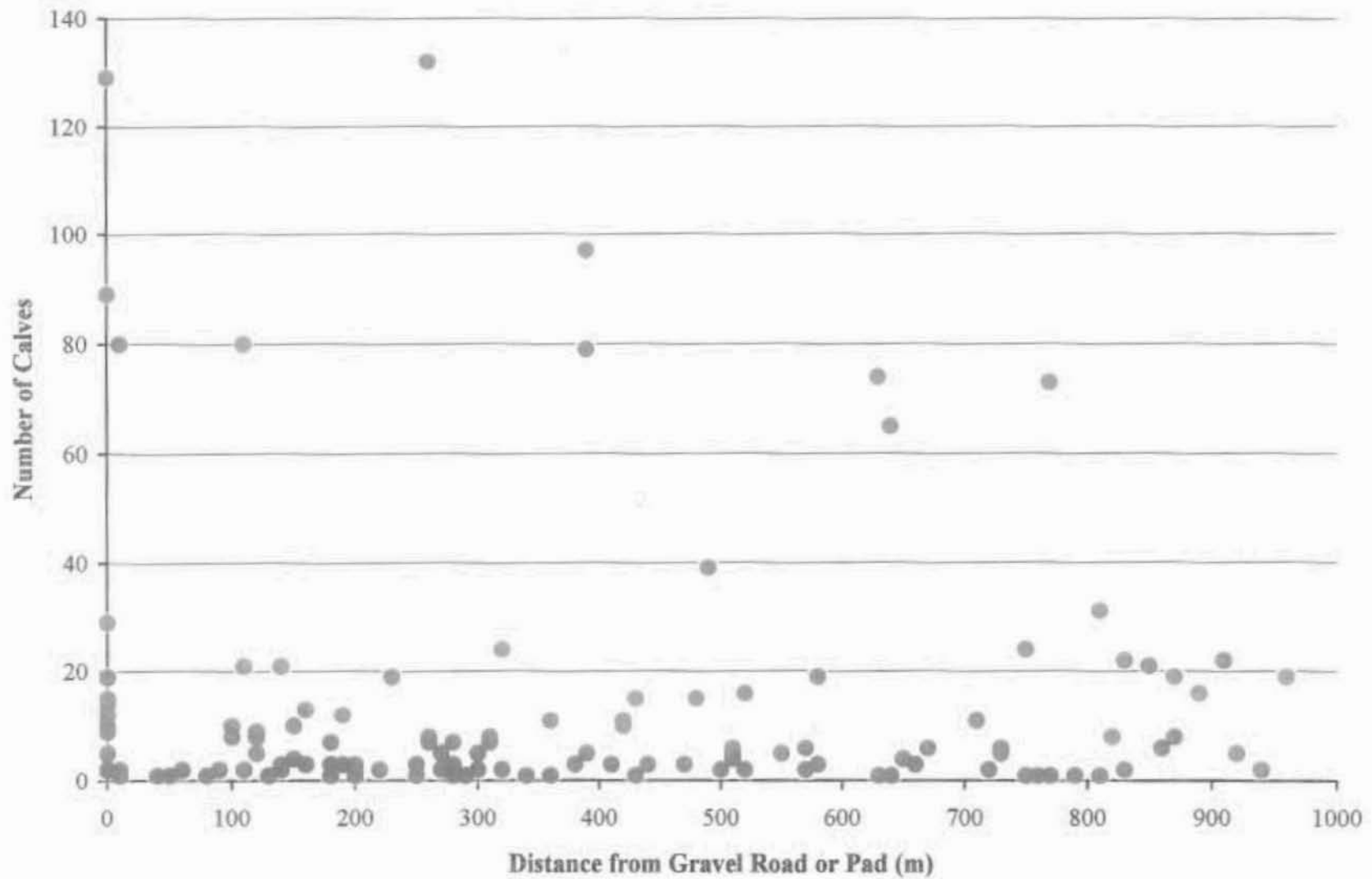


Figure 3. Calf distribution among groups as observed from roads during the post-calving period, 22–29 June 2000 ( $n = 123$ ).

16

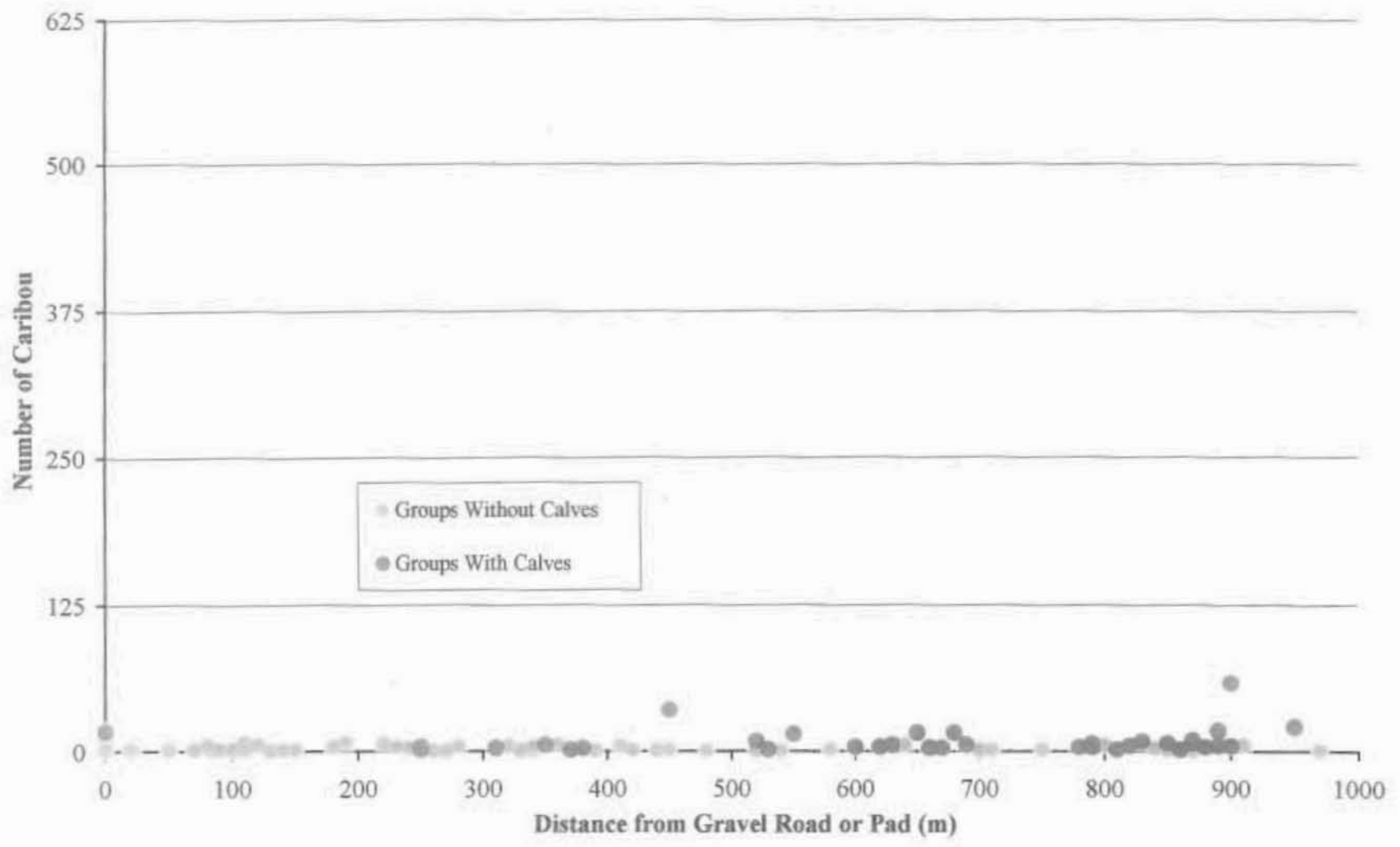


Figure 4. Distribution of groups with calves ( $n = 35$ ) and without calves ( $n = 75$ ) as observed from roads during the calving period, 15–22 June 2000.

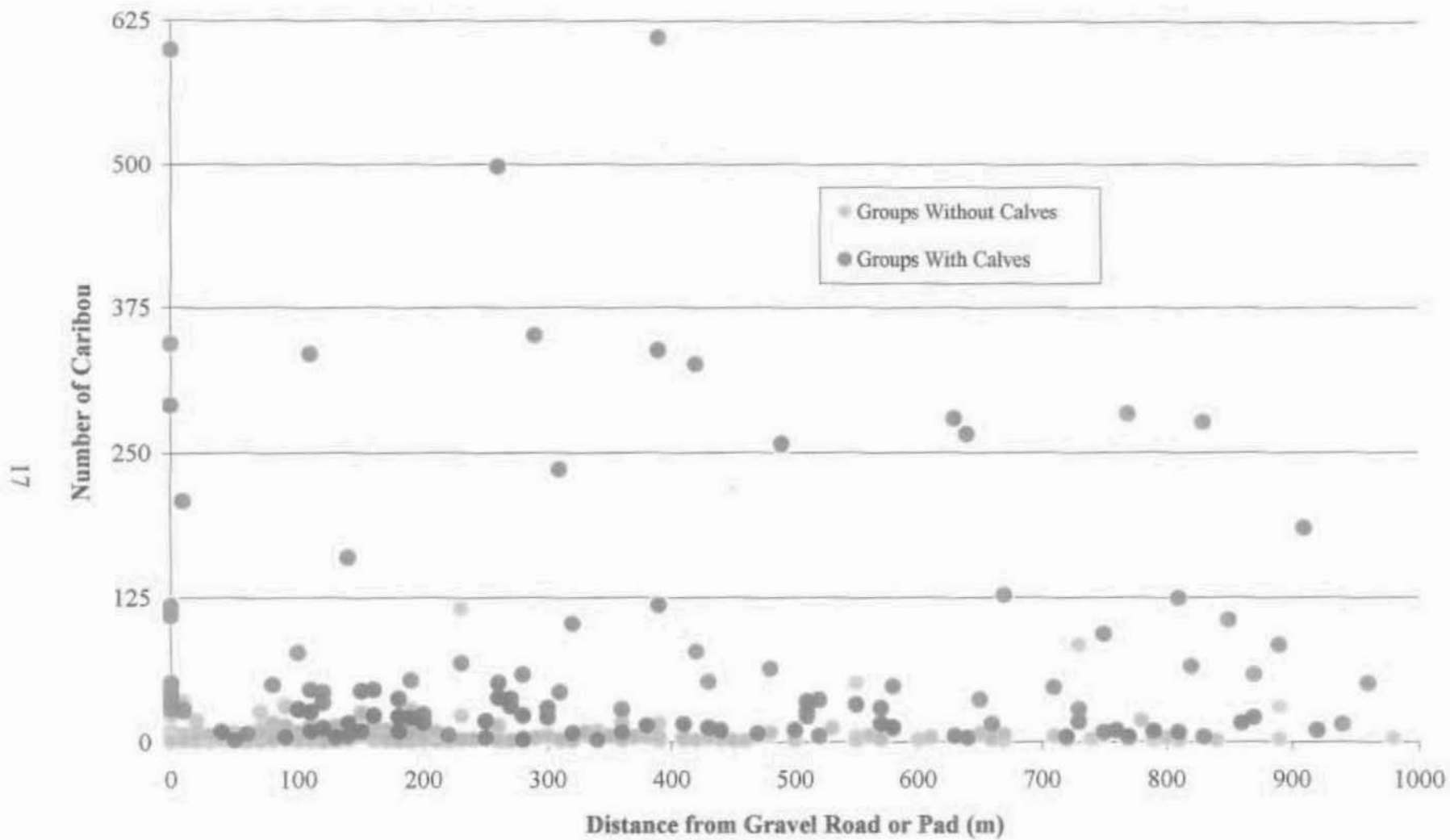


Figure 5. Distribution of groups with calves ( $n = 123$ ) and without calves ( $n = 240$ ) as observed from roads during the post-calving period, 22–29 June 2000 (excluding one group of ~2000 caribou with calves on road).

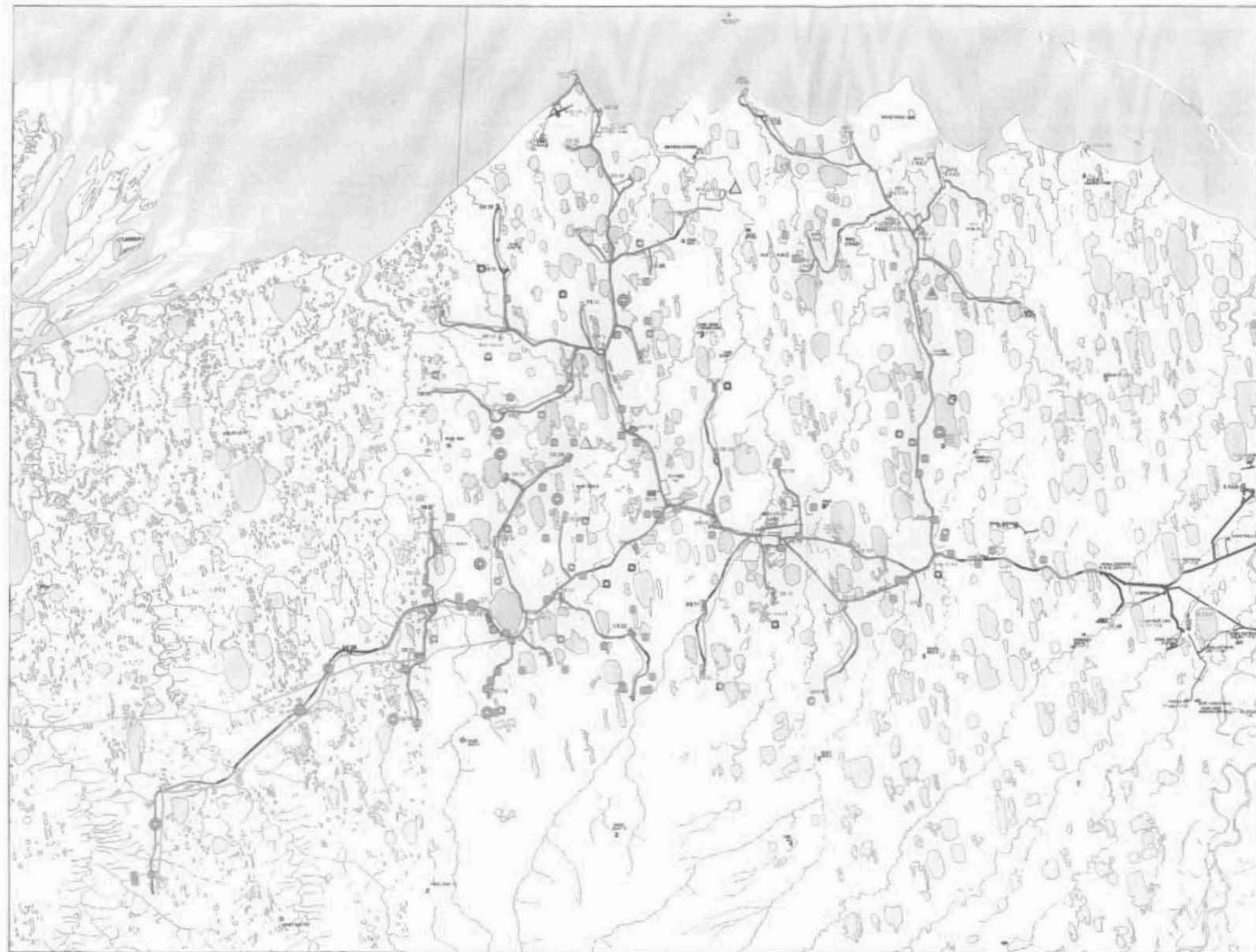


Figure 6. Caribou group locations within 1 km of gravel roads and pads surveyed during the calving period, Milne Point, Kuparuk, and Prudhoe Bay oilfields, Alaska, 15 through 22 June 2000.

**Caribou Group Size**

- 1 to 10 (n = 111)
- 11 to 100 (n = 14)
- Groups with calves

**Grizzly Bear Locations**

- △ Grizzly
- ▲ Grizzly with cubs



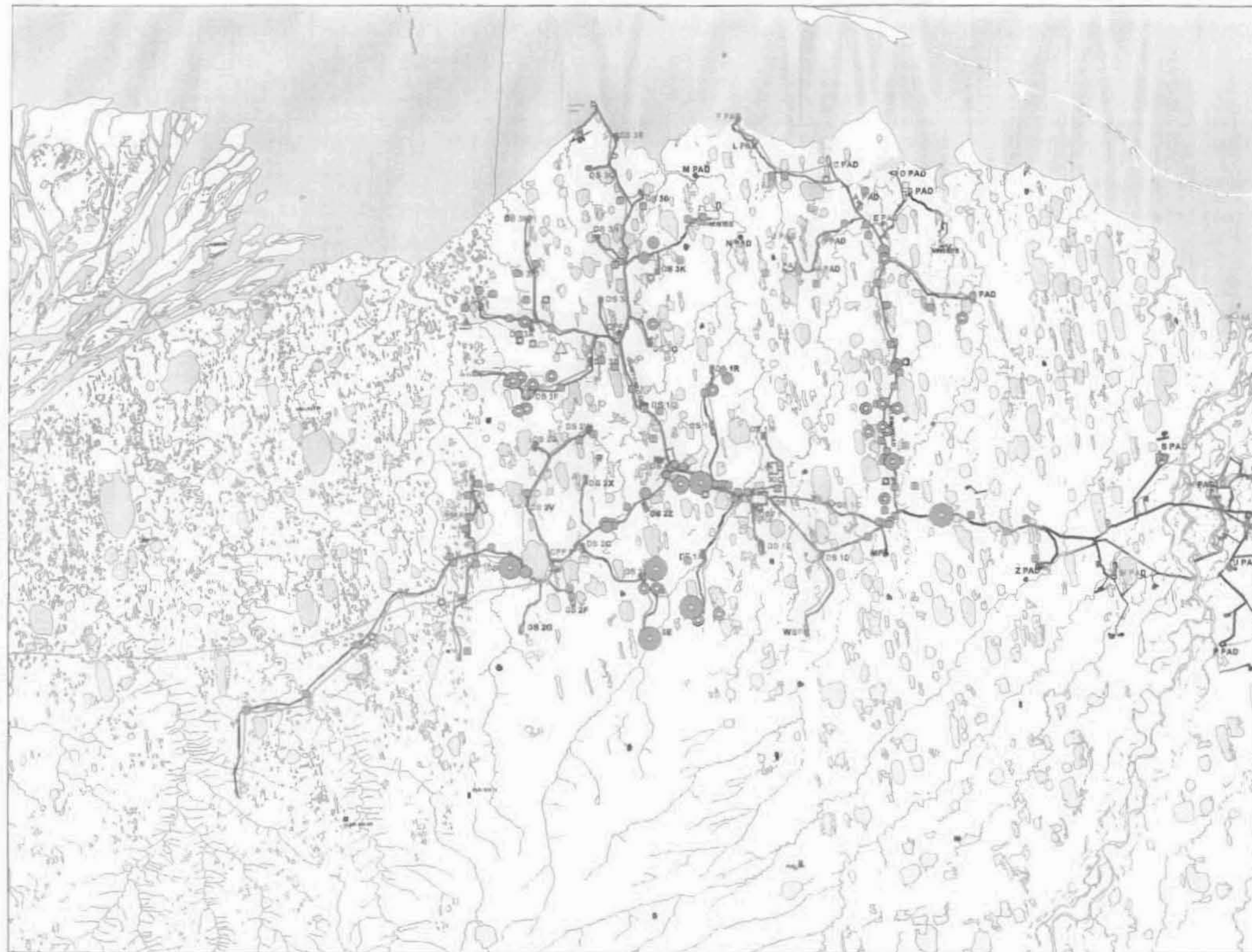


Figure 7. Caribou group locations within 1 km of gravel roads and pads surveyed during the post-calving period, Milne Point, Kuparuk, and Prudhoe Bay oilfields, Alaska, 22 through 25 June 2000.

**Caribou Group Size**

- 1 to 10 (n = 134)
- 11 to 100 (n = 32)
- 101 to 250 (n = 3)
- 251 to 1000 (n = 6)
- Groups with calves

**Grizzly Bear Locations**

- △ Grizzly
- ▲ Grizzly with cubs



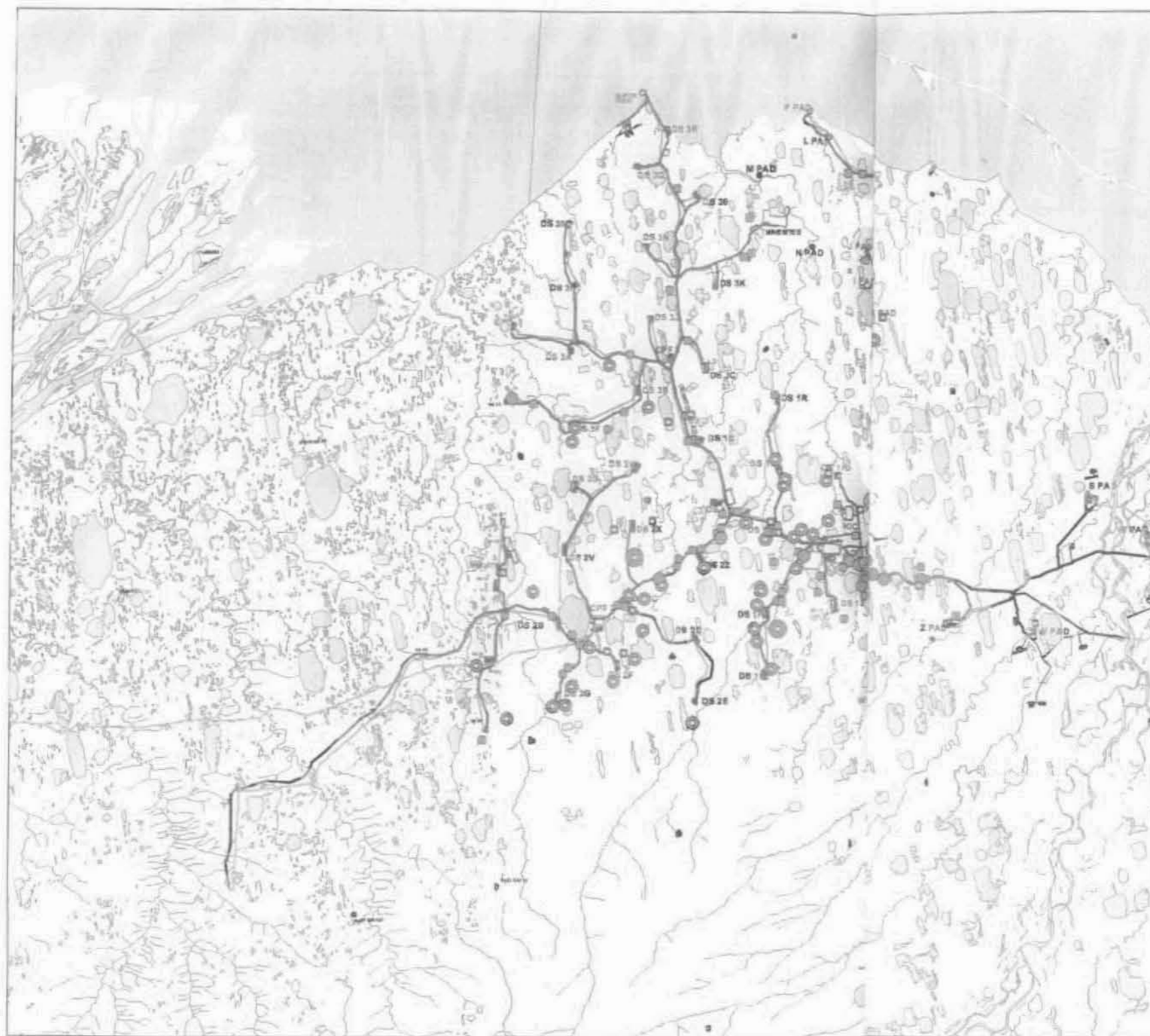


Figure 8. Caribou group locations within 1 km of gravel roads and pads surveyed during the post-calving period, Milne Point, Kuparuk, and Prudhoe Bay oilfields, Alaska, 25 through 29 June 2000.

**Caribou Group Size**

- 1 to 10 (n = 113)
- 11 to 100 (n = 78)
- 101 to 250 (n = 9)
- 251 to 1000 (n = 8)
- Groups with calves

**Grizzly Bear Locations**

- △ Grizzly
- ▲ Grizzly with cubs





Table 1. Data summaries of caribou observed within 1 km of gravel roads and pads in the Milne Point, Kuparuk, and Prudhoe Bay oilfields, North Slope, Alaska, June 2000.

Observation Day	Date (June '00)	Total No. of Caribou	No. of Observation Hours <sup>1</sup>	Caribou/Hour	No. of Groups	Average Group Size	No. of Groups with Calf Present	Percent of Groups with Calf Present	No. of Calves Observed
<b>Calving<sup>2</sup></b>									
1	15/16	15	10	1.5	3	5	2	66.7	3
2	16/17	84	11.5	7.3	11	7.6	6	54.5	24
3	17/18	49	12	4.1	13	3.8	8	61.5	17
4	18/19	96	11	8.7	18	5.3	4	22.2	13
5	19/20	19	6.5	2.9	6	3.2	2	33.3	4
6	20/21	148	14	10.6	32	4.6	8	25.0	12
7	21/22	132	15	8.8	27	4.9	5	18.5	23
1-7	15-22	543	80	6.8	110	4.9	35	31.8	96
<b>Post-Calving</b>									
8	22/23	552	12.5	44.2	40	13.8	14	35.0	130
9	23/24	1,789	13.25	135.0	46	38.9	12	26.1	367
10	24/25	761	12	63.4	36	21.1	6	16.7	95
11	25/26	743	12.5	59.4	36	20.6	8	22.2	145
12	26/27	6,325	16.5	383.3	49	129.1	20	40.8	550
13	27/28	1,555	14	111.1	80	19.4	30	37.5	210
14	28/29	909	11.5	79	54	16.8	27	50.0	215
15	29	150	6	25	21	7.1	6	28.6	18
8-15	22-29	12,784	98.25	130.1	362	35.3	123	34.0	1730
<b>Study Totals</b>									
15	15-29	13,327	178.25	74.8	472	28.2	158	33.5	1,826

<sup>1</sup> Effort of two observers on same shift considered equal to one observer working alone.

<sup>2</sup> Calving late in 2000 due to environmental factors.

Table 2. Number and percentage of caribou groups with and without calves, number of animals, and average group size during calving (15-22 June 2000) and post-calving (22-29 June 2000) by 200 m intervals from gravel roads and pads within the Milne Point, Kuparuk, and Prudhoe Bay oilfields, Alaska.

	Intervals (m)															
	0 (on or crossing road)				0-200				201-400				401-600			
	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size
<b>Calving</b>																
w/calves	1	3	18	18.0	1	3	18	18.0	6	17	20	3.3	5	14	66	13.2
w/o calves	9	12	39	4.3	32	43	108	3.4	16	21	47	2.9	12	16	21	1.8
total	10	9	57	5.7	33	30	126	3.8	22	20	67	3.0	17	15	87	5.1
<b>Post-Calving</b>																
w/calves	12	10	3,693	307.8	45	37	5,141	114.2	27	22	2,741	101.5	20	16	1,091	54.6
w/o calves	18	8	99	5.5	142	59	843	5.9	52	22	399	7.7	20	8	128	6.4
total	30	8	3,792	126.4	187	52	5,984	32.0	79	22	3,140	39.7	40	11	1,219	30.5
<b>Study Totals</b>																
w/calves	13	8	3,711	285.5	46	29	5,159	112.2	33	21	2,761	83.7	25	16	1,157	46.3
w/o calves	27	9	138	5.1	174	55	951	5.5	68	22	446	6.6	32	10	149	4.7
total	40	8	3,849	96.2	220	47	6,110	27.8	101	21	3,207	31.8	57	12	1,306	22.9

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(continued from above)

	Intervals (m)												Mean Group Distance (m)
	601-800				801-1000				0-1000				
	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size	No. of Groups	Percent Groups (0-1000)	No. of Animals	Avg. Group Size	
<b>Calving</b>													
w/calves	10	29	69	6.9	13	37	154	11.8	35	100	327	9.3	653
w/o calves	8	11	26	3.3	7	9	14	2.0	75	100	216	2.9	327
total	18	16	95	5.3	20	18	168	8.4	110	100	543	4.9	431
<b>Post-Calving</b>													
w/calves	17	14	1,233	72.5	14	11	1,019	72.8	123	100	11,225	91.3	376
w/o calves	18	8	149	8.3	7	3	40	5.7	239	100	1,559	6.5	232
total	35	10	1,382	39.5	22	6	1,059	48.1	363	100	12,784	35.2	281
<b>Study Totals</b>													
w/calves	27	17	1,302	48.2	27	17	1,173	43.4	158	100	11,552	73.1	437
w/o calves	26	8	175	6.7	14	5	54	3.9	314	100	1,775	5.7	255
total	53	11	1,477	27.9	41	9	1,227	29.9	472	100	13,327	28.2	316

**APPENDIX A**

**JUNE 2000 DATA**

**Appendix A.** Data for caribou groups observed during June 2000 road surveys in the Milne Point, Kuparuk, and Prudhoe Bay oilfields, North Slope, Alaska. [UTM coordinates recorded in WGS 84 datum; distances in meters; bearings from true North (31.5 degrees East declination)].

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH1	1	06/15/00	5:43:00 PM	404814	7796734	2	1		3	702	272	178	-701.6	24.499	404112.4276	7796758.499	670
CAH2	1	06/15/00	10:18:00 PM	403552	7816474	5			5	552	340	110	-188.8	518.71	403363.2049	7816992.71	320
CAH3	1	06/16/00	1:19:00 AM	409664	7810582	5	2		7	850	90	0	850	0	410514	7810582	850
CAH4	2	06/16/00	1:11:00 PM	399308	7797986	1	1		2	900	128	322	709.21	-554.1	400017.2097	7797431.905	860
CAH5	2	06/16/00	3:35:00 PM	392899	7804698	3			3	900	232	218	-709.2	-554.1	392189.7903	7804143.905	620
CAH5a	2	06/16/00	3:35:00 PM	392899	7804698	2			2	950	124	326	787.59	-531.2	393686.5857	7804166.767	850
CAH6	2	06/16/00	4:56:00 PM	393138	7805218	4	3		7	850	109	341	803.69	-276.7	393941.6908	7804941.267	790
CAH7	2	06/16/00	5:52:00 PM	391704	7808816	2			2	450	134	316	323.7	-312.6	392027.7029	7806503.404	440
CAH8	2	06/16/00	6:42:00 PM	393253	7808053	1			1	538	19	71	175.16	508.69	393428.1557	7808561.689	530
CAH9	2	06/16/00	7:13:00 PM	393200	7808067	1			1	815	306	144	-659.3	479.04	392540.6511	7808546.045	810
CAH10	2	06/16/00	8:00:00 PM	390294	7807139	42	17		59	917	348	102	-190.7	896.96	390103.345	7808035.961	900
CAH11	2	06/16/00	9:20:00 PM	390223	7804722	1	1		2	253	128	322	199.37	-155.8	390422.3667	7804566.238	250
CAH12	2	06/16/00	10:01:00 PM	390474	7802416	1	1		2	523	248	202	-484.9	-195.9	389989.0828	7802220.081	530
CAH13	2	06/16/00	10:24:00 PM	393444	7802403	2	1		3	447	343	107	-130.7	427.47	393313.3098	7802830.468	310
CAH14	3	06/17/00	1:39:00 PM	391796	7810191	1	1		2	376	158	292	140.85	-348.6	391936.8521	7809842.379	370
CAH15	3	06/17/00	2:12:00 PM	390203	7809997	1			1	687	28	62	322.53	606.58	390525.527	7810603.585	480
CAH16	3	06/17/00	2:38:00 PM	390002	7809507	10	5		15	558	180	270	-1E-13	-558	390002	7808949	550
CAH17	3	06/17/00	3:15:00 PM	611886	7810949	2	2		4	643	356	94	-44.85	641.43	611841.1466	7811590.434	620
CAH18	3	06/17/00	3:57:00 PM	392913	7810727	1			1	272	342	108	-84.05	258.89	392828.9474	7810985.687	250
CAH19	3	06/17/00	4:30:00 PM	390049	7813205	2	2		4	900	217	233	-541.6	-718.8	389507.3665	7812486.228	880
CAH20	3	06/17/00	5:28:00 PM	390251	7815124	1			1	131	100	350	129.01	-22.75	390380.0098	7815101.252	110
CAH21	3	06/17/00	6:25:00 PM	390019	7818559	1	1		2	840	267	183	-838.8	-43.96	389180.1512	7816515.038	810
CAH22	3	06/17/00	7:27:00 PM	393711	7814951	3	2		5	900	295	155	-815.7	380.36	392895.323	7815331.356	890
CAH23	3	06/17/00	7:59:00 PM	395946	7813718	3			3	850	63	27	757.36	385.89	396703.3555	7814103.892	840
CAH24	3	06/17/00	8:22:00 PM	396054	7813463	2	2		4	800	86	4	798.05	55.805	396852.0512	7813518.805	780
CAH25	3	06/17/00	9:16:00 PM	396425	7817324	4	2		6	358	350	100	-62.17	352.56	396362.834	7817676.561	350
CAH26	3	06/17/00	9:37:00 PM	396770	7816252	1			1	355	201	249	-127.2	-331.4	396642.7794	7815920.579	340
CAH27	4	06/18/00	7:14:00 PM	394919	7799649	2			2	428	193	257	-96.28	-417	394822.7209	7799231.97	420
CAH28	4	06/18/00	7:41:00 PM	396136	7797319	1			1	447	100	350	440.21	-77.62	396576.2091	7797241.379	440
CAH29	4	06/18/00	7:56:00 PM	396121	7797039	1			1	750	72	18	713.29	231.76	396834.2924	7797270.763	700
CAH30	4	06/18/00	8:17:00 PM	395981	7797020	1			1	544	316	134	-377.9	391.32	395603.1058	7797411.321	540
CAH31	4	06/18/00	9:39:00 PM	389657	7796876	12	4		16	664	194	256	-160.6	-644.3	389496.3639	7796231.724	650
CAH32	4	06/18/00	11:25:00 PM	389989	7803457	14	4		18	900	241	209	-787.2	-436.3	389201.8423	7803020.671	890
CAH32a	4	06/18/00	11:25:00 PM	389989	7803457	2			2	75	138	312	50.185	-55.74	390039.1848	7803401.264	0
CAH33	4	06/19/00	12:40:00 AM	612666	7803651	5			5	125	86	4	124.7	8.7196	612790.6955	7803659.72	0
CAH34	4	06/19/00	12:59:00 AM	612419	7805152	6			6	804	89	1	803.88	14.032	613222.8775	7805166.032	800
CAH35	4	06/19/00	2:04:00 AM	612803	7801130	3			3	198	187	263	-24.13	-196.5	612778.8699	7800933.476	240
CAH36	4	06/19/00	2:25:00 AM	612629	7799729	2	1		3	422	110	340	396.55	-144.3	613025.5503	7799584.667	380
CAH37	4	06/19/00	4:00:00 AM	607328	7795760	11			11	0	0	90	0	0	607328	7795760	0
CAH39	4	06/19/00	5:16:00 AM	601416	7787782	1			1	0	0	90	0	0	601416	7787782	0
CAH39a	4	06/18/00	11:25:00 PM	601416	7787782	2			2	750	262	188	-742.7	-104.4	600673.2989	7787677.62	700

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## Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH40	4	06/19/00	5:32:00 AM	601450	7786933	2			2	850	303	147	-712.9	462.94	600737.13	7787395.943	700
CAH38	4	06/19/00	6:38:00 AM	601374	7790034	14	4		18	0	0	90	0	0	601374	7790034	0
CAH41	4	06/19/00	6:59:00 AM	608401	7797780			2	2	25	303	147	-20.97	13.616	608380.0332	7797793.616	22
CAH41a	4	06/19/00	6:59:00 AM	608401	7797780	2			2	85	120	330	73.612	-42.5	608474.6122	7797737.5	83
CAH42	5	06/19/00	8:55:00 PM	407828	7801941			1	1	537	173	277	65.444	-533	407893.4438	7801408.003	520
CAH43	5	06/19/00	9:18:00 PM	412339	7803245	1			1	398	1	89	6.9461	397.94	412345.9461	7803642.939	390
CAH44	5	06/19/00	9:30:00 PM	414625	7802841			2	2	371	4	86	25.88	370.1	414650.8797	7803211.096	340
CAH45	5	06/19/00	10:20:00 PM	409058	7807057	1			1	64	351	99	-10.01	63.212	409047.9882	7807120.212	0
CAH46	5	06/19/00	10:36:00 PM	409001	7808837	7	2		9	839	277	173	-832.7	102.25	408168.2538	7808939.248	830
CAH47	5	06/19/00	10:56:00 PM	409666	7810576	3	2		5	824	100	350	811.48	-143.1	410477.4816	7810432.914	820
CAH48	6	06/20/00	11:56:00 AM	408272	7802217	2			2	192	280	170	-189.1	33.34	408082.9169	7802250.34	150
CAH49	6	06/20/00	12:17:00 PM	409615	7804493	4	2		6	626	94	356	624.48	-43.67	410239.4751	7804449.332	630
CAH50	6	06/20/00	12:30:00 PM	409650	7805121	1			1	147	144	306	86.404	-118.9	409736.4044	7805002.075	90
CAH51	6	06/20/00	1:18:00 PM	408849	7816027	1			1	980	305	145	-802.8	562.1	407846.231	7816589.105	970
CAH52	6	06/20/00	4:17:00 PM	410510	7803265	3	1		4	950	220	230	-610.6	-727.7	409899.3518	7802537.258	600
CAH53	6	06/20/00	4:27:00 PM	411904	7803215	8			8	297	228	222	-220.7	-198.7	411683.286	7803016.268	190
CAH54	6	06/20/00	8:58:00 PM	396223	7803441	4	1		5	650	197	253	-190	-621.6	396032.9584	7802819.402	900
CAH55	6	06/20/00	9:30:00 PM	394384	7802721	3	1		4	850	139	311	557.65	-641.5	394941.6502	7802079.497	790
CAH55a	6	06/20/00	9:30:00 PM	394384	7802721	2			2	596	243	207	-531	-270.6	393852.9601	7802450.422	150
CAH56	6	06/20/00	9:54:00 PM	392948	7805349	14	2		16	889	337	113	-269.2	634.23	392678.7863	7805983.228	680
CAH57	6	06/20/00	10:33:00 PM	392302	7801235	6			6	125	323	127	-75.23	99.829	392226.7731	7801334.829	120
CAH58	6	06/20/00	10:59:00 PM	395985	7800065	6			6	900	8	82	125.26	891.24	396110.2558	7800956.241	910
CAH59	6	06/20/00	11:09:00 PM	396230	7799768	2			2	433	103	347	421.9	-97.4	396651.9022	7799670.596	420
CAH60	6	06/20/00	11:22:00 PM	396701	7798054	6			6	353	126	324	285.58	-207.5	396986.583	7797846.512	360
CAH61	6	06/20/00	11:49:00 PM	395983	7797018	5			5	485	314	136	-348.9	336.91	395634.1202	7797354.909	410
CAH62	6	06/21/00	1:20:00 AM	390654	7799483	3			3	0	0	90	0	0	390654	7799483	0
CAH63	6	06/21/00	12:44:00 AM	392124	7799057	6	1		7	875	54	36	707.89	514.31	392831.8899	7799571.312	870
CAH64	6	06/21/00	12:56:00 AM	392476	7798416	6			6	647	111	339	604.03	-231.9	393080.0265	7798184.136	640
CAH65	6	06/21/00	1:33:00 AM	390542	7798620			2	2	741	131	319	559.24	-486.1	391101.2398	7798133.86	750
CAH66	6	06/21/00	1:40:00 AM	389864	7798041	1			1	137	81	9	135.31	21.432	389999.3133	7798062.432	130
CAH67	6	06/21/00	1:46:00 AM	389744	7797673			1	1	75	250	200	-70.48	-25.65	389673.5231	7797647.348	50
CAH68	6	06/21/00	1:58:00 AM	389698	7796879	4	2		6	700	141	309	440.52	-544	390138.5243	7796334.998	690
CAH69	6	06/21/00	2:08:00 AM	389509	7796887	2			2	750	151	299	363.61	-656	389872.6072	7796231.035	660
CAH69a	6	06/21/00	2:08:00 AM	389509	7796887	2			2	415	351	99	-64.92	409.89	389444.0797	7797296.891	90
CAH70	6	06/21/00	2:32:00 AM	390397	7799701	2			2	100	350	100	-17.36	98.481	390379.6352	7799799.481	90
CAH71	6	06/21/00	2:39:00 AM	390018	7799969	2		2	4	225	270	180	-225	3E-14	389793	7799969	180
CAH72	6	06/21/00	4:40:00 AM	388847	7801104	8		2	10	0	0	90	0	0	388847	7801104	0
CAH73	6	06/21/00	3:11:00 AM	388297	7801155	8			8	140	170	280	24.311	-137.9	388321.3107	7801017.127	110
CAH73a	6	06/21/00	3:11:00 AM	388297	7801155	5			5	322	348	102	-66.95	314.96	388230.0524	7801469.964	280
CAH74	6	06/21/00	3:42:00 AM	612120	7798052	1			1	279	273	177	-278.6	14.602	611841.3824	7798066.602	260
CAH75	6	06/21/00	4:02:00 AM	612652	7795696	4			4	0	0	90	0	0	612652	7795696	0
CAH76	6	06/21/00	4:19:00 AM	612512	7795479	8	2		10	1000	285	165	-965.9	258.82	611546.0742	7795737.819	870
CAH77	7	06/21/00	7:55:00 AM	408406	7802324	2			2	77	220	230	-49.49	-58.99	408356.5054	7802265.015	20
CAH78	7	06/21/00	8:12:00 AM	409596	7804220	1			1	582	90	0	582	0	410178	7804220	580

## Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH79	7	06/21/00	8:36:00 AM	408979	7807750	2			2	340	78	12	332.57	70.69	409311.5702	7807820.69	330
CAH80	7	06/21/00	8:47:00 AM	408999	7808527	3	1		4	248	270	180	-248	3E-14	408751	7808527	250
CAH81	7	06/21/00	9:00:00 AM	409005	7808851	17	4		21	975	80	10	960.19	169.31	409965.1876	7809020.307	950
CAH82	7	06/21/00	9:18:00 AM	409529	7811719	2			2	484	258	192	-473.4	-100.6	409055.5766	7811618.371	450
CAH83	7	06/21/00	11:44:00 AM	405541	7818338	3			3	395	310	140	-302.6	253.9	405238.4124	7818591.901	380
CAH84	7	06/21/00	12:08:00 PM	403786	7818040	1			1	900	270	180	-900	1E-13	402886	7818040	870
CAH85	7	06/21/00	1:14:00 PM	410332	7803317			7	7	232	40	50	149.13	177.72	410481.1267	7803494.722	220
CAH86	7	06/21/00	9:04:00 PM	403557	7804200	2		1	3	60	349	101	-11.45	58.898	403546.5515	7804258.898	50
CAH87	7	06/21/00	9:51:00 PM	402610	7807644	2			2	0	0	90	0	0	402610	7807644	0
CAH88	7	06/21/00	9:38:00 PM	403583	7805139	2			2	820	55	35	671.7	470.33	404254.7047	7805609.333	710
CAH89	7	06/21/00	10:12:00 PM	402628	7803853	2		4	6	167	140	310	107.35	-127.9	402735.3455	7803725.071	120
CAH90	7	06/21/00	10:37:00 PM	402507	7801190	2	1		3	950	182	268	-33.15	-949.4	402473.8455	7800240.579	660
CAH91	7	06/21/00	11:51:00 PM	399682	7804726	4			4	411	184	266	-28.67	-410	399653.3301	7804316.001	340
CAH92	7	06/22/00	12:03:00 AM	399681	7805619	2			2	110	265	185	-109.6	-9.587	399571.4186	7805609.413	100
CAH93	7	06/22/00	12:33:00 AM	399825	7811245	8	1		9	520	103	347	506.67	-117	400331.6724	7811128.025	520
CAH94	7	06/22/00	1:00:00 AM	398013	7805634	2			2	111	145	305	63.667	-90.93	398076.667	7805543.074	70
CAH95	7	06/22/00	1:15:00 AM	397223	7805027	1		1	2	140	98	352	138.64	-19.48	397361.6375	7805007.516	140
CAH95a	7	06/22/00	1:15:00 AM	397223	7805027	2			2	225	354	96	-23.52	223.77	397199.4811	7805250.767	110
CAH95b	7	06/22/00	1:15:00 AM	397223	7805027	2			2	581	295	155	-526.6	245.54	396696.4352	7805272.541	580
CAH96	7	06/22/00	1:43:00 AM	396054	7808900	1			1	526	265	185	-524	-45.84	395530.0016	7808854.156	330
CAH96a	7	06/22/00	1:43:00 AM	396054	7808900	1			1	414	150	300	207	-358.5	398261	7808541.465	270
CAH97	7	06/22/00	1:49:00 AM	395506	7810051			2	2	45	68	22	41.723	16.857	395547.7233	7810067.857	50
CAH98	7	06/22/00	1:58:00 AM	395133	7813520	4			4	232	108	342	220.65	-71.69	395353.6451	7813448.308	230
CAH99	7	06/22/00	4:59:00 AM	395146	7815064	20	16		36	456	92	358	455.72	-15.91	395601.7222	7815048.086	450
CAH100	7	06/22/00	5:24:00 AM	399936	7804845	6			6	112	230	220	-85.8	-71.99	399850.203	7804773.008	80
CAH101	8	06/22/00	7:56:00 AM	408187	7802138	6		2	8	81	198	252	-25.03	-77.04	408161.9696	7802060.964	50
CAH102	8	06/22/00	8:20:00 AM	409614	7804807	3			3	1000	90	0	1000	0	410614	7804807	980
CAH103	8	06/22/00	8:24:00 AM	409613	7804809	29	19		48	950	220	230	-610.6	-727.7	409002.3518	7804081.258	580
CAH104	8	06/22/00	9:05:00 AM	409664	7810577	4	1		5	1000	28	62	469.47	882.95	410133.4716	7811459.948	630
CAH105	8	06/22/00	11:07:00 AM	405172	7816451	3			3	723	170	280	125.55	-712	405297.5476	7815738.984	670
CAH106	8	06/22/00	11:28:00 AM	403540	7816423	1			1	975	264	186	-969.7	-101.9	402570.3412	7816321.085	840
CAH107	8	06/22/00	8:12:00 PM	400835	7804390	1			1	310	163	287	90.635	-296.5	400925.6352	7804093.546	120
CAH108	8	06/22/00	8:23:00 PM	400052	7804695	2			2	330	42	48	220.81	245.24	400272.8131	7804940.238	340
CAH108a	8	06/22/00	8:23:00 PM	400052	7804695	2			2	448	56	34	371.41	250.52	400423.4088	7804945.518	360
CAH108b	8	06/22/00	8:23:00 PM	400052	7804695	2			2	600	77	13	584.62	134.97	400636.622	7804829.971	310
CAH109	8	06/22/00	8:32:00 PM	399911	7804919	1			1	0	0	90	0	0	399911	7804919	0
CAH110	8	06/22/00	8:40:00 PM	397580	7805811	2			2	238	242	208	-210.1	-111.7	397369.8585	7805899.266	210
CAH111	8	06/22/00	8:53:00 PM	396670	7808597	4			4	367	46	44	264	254.94	396933.9977	7808851.94	370
CAH112	8	06/22/00	9:08:00 PM	396070	7808963	4		1	5	80	51	39	62.172	50.346	396132.1717	7809013.346	60
CAH113	8	06/22/00	9:16:00 PM	395489	7810127	2			2	78	224	226	-54.18	-56.11	395434.8166	7810070.891	60
CAH114	8	06/22/00	9:40:00 PM	396028	7813514	20	16		36	550	88	2	549.66	19.195	396577.665	7813533.195	520
CAH115	8	06/22/00	10:08:00 PM	397915	7817923	1			1	900	176	274	62.781	-897.8	397977.7808	7817025.192	840
CAH116	8	06/22/00	10:36:00 PM	396705	7816263	1	1		2	345	233	217	-275.5	-207.6	396429.4707	7816055.374	340
CAH117	8	06/22/00	10:48:00 PM	394787	7816959	2			2	60	235	215	-49.15	-34.41	394737.8509	7816924.585	60

## Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Cal#	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH118	8	06/22/00	11:24:00 PM	390251	7814812	2	1		3	650	85	5	647.53	56.651	390898.5266	7814868.651	640
CAH118a	8	06/22/00	11:24:00 PM	390251	7814812	1			1	435	280	170	-428.4	75.537	389822.6086	7814887.537	420
CAH119	8	06/22/00	11:49:00 PM	389715	7813692	18	10		28	0	0	90	0	0	389715	7813692	0
CAH119a	8	06/22/00	11:49:00 PM	389715	7813692	3			3	750	201	249	-268.8	-700.2	389446.224	7812991.815	610
CAH120	8	06/23/00	12:02:00 AM	388958	7813813	1			1	55	348	102	-11.44	53.798	388946.5649	7813866.798	50
CAH121	8	06/23/00	12:30:00 AM	611750	7814310	2			2	750	272	178	-749.5	26.175	611000.4569	7814336.175	740
CAH122	8	06/23/00	12:37:00 AM	611777	7814556	1			1	750	352	98	-104.4	742.7	611672.6202	7815298.701	720
CAH122a	8	06/23/00	12:37:00 AM	611777	7814556	1			1	900	46	44	647.41	625.19	612424.4058	7815181.193	790
CAH123	8	06/23/00	12:59:00 AM	390094	7813203	7	1		8	750	171	279	117.33	-740.8	390211.3258	7812462.234	750
CAH123a	8	06/23/00	12:59:00 AM	390094	7813203	3	1		4	820	229	221	-618.9	-538	389475.1381	7812665.032	770
CAH124	8	06/23/00	1:13:00 AM	390305	7816542	3			3	280	358	92	-9.772	279.83	390295.2281	7816821.829	280
CAH125	8	06/23/00	1:46:00 AM	393353	7811688			2	2	451	99	351	445.45	-70.55	393798.4474	7811617.448	440
CAH126	8	06/23/00	1:56:00 AM	393373	7811276	4			4	1100	91	359	1099.8	-19.2	394472.8326	7811256.802	550
CAH127	8	06/23/00	2:26:00 AM	391481	7810016	31	4		35	800	336	114	-325.4	730.84	391155.6107	7810746.836	510
CAH127a	8	06/23/00	2:26:00 AM	391481	7810016	7			7	210	71	19	198.56	68.369	391679.5589	7810084.369	40
CAH128	8	06/23/00	2:48:00 AM	390111	7810045	18	3		21	255	15	75	65.999	246.31	390176.9989	7810291.311	190
CAH128a	8	06/23/00	2:48:00 AM	390111	7810045	48	15		63	825	317	133	-562.6	603.37	389548.3514	7810648.367	480
CAH129	8	06/23/00	3:59:00 AM	390028	7809526	17	5		22	580	194	256	-135.5	-543.4	389892.5237	7808982.634	510
CAH129a	8	06/23/00	3:59:00 AM	390028	7809526			3	3	278	12	78	57.799	271.93	390085.7995	7809797.925	50
CAH130	8	06/23/00	3:12:00 AM	388996	7810546	88	29		117	125	131	319	94.339	-82.01	389090.3387	7810463.993	0
CAH131	8	06/23/00	4:18:00 AM	389824	7809494	69	24		93	750	213	237	-408.5	-829	389415.5207	7808864.997	750
CAH132	9	06/23/00	7:13:00 AM	403125	7804220	3		5	8	481	20	70	164.51	451.99	403289.5117	7804671.992	330
CAH133	9	06/23/00	7:20:00 AM	405369	7803965	1			1	121	40	50	77.777	92.691	405446.7773	7804057.691	110
CAH134	9	06/23/00	7:36:00 AM	408884	7802649			4	4	126	360	90	8E-15	126	408884	7802775	120
CAH135	9	06/23/00	7:42:00 AM	409551	7803140	2			2	0	0	90	0	0	409551	7803140	0
CAH136	9	06/23/00	7:49:00 AM	409622	7804806	2			2	61	210	240	-30.5	-52.83	409591.5	7804753.172	30
CAH138	9	06/23/00	8:12:00 AM	408981	7807829	3			3	144	70	20	135.32	49.251	409116.3157	7807878.251	140
CAH139	9	06/23/00	8:35:00 AM	409002	7808819	31	19		50	975	280	170	-960.2	169.31	408041.8124	7808988.307	960
CAH140	9	06/23/00	10:28:00 AM	403687	7821639			1	1	141	220	230	-90.63	-108	403596.3669	7821530.988	120
CAH141	9	06/23/00	10:36:00 AM	403070	7821784	5			5	310	210	240	-155	-268.5	402915	7821515.532	300
CAH142	9	06/23/00	11:03:00 AM	405931	7818513	3			3	280	194	256	-67.74	-271.7	405863.2619	7818241.317	250
CAH143	9	06/23/00	11:47:00 AM	408290	7818787			1	1	528	206	244	-231.5	-474.6	408058.54	7818312.437	450
CAH144	9	06/23/00	9:29:00 PM	401112	7804412	1		1	2	50	360	90	3E-15	50	401112	7804462	10
CAH145	9	06/23/00	9:37:00 PM	399419	7805300	4			4	210	192	258	-43.66	-205.4	399375.3385	7805094.589	140
CAH146	9	06/23/00	9:49:00 PM	397809	7805676	121	6		127	800	161	289	260.45	-756.4	398089.4545	7804919.585	670
CAH147	9	06/23/00	10:01:00 PM	397511	7805530	1			1	280	6	84	29.268	278.47	397540.268	7805808.466	30
CAH147a	9	06/23/00	10:01:00 PM	397511	7805530	2			2	300	252	198	-285.3	-92.71	397225.683	7805437.295	120
CAH147b	9	06/23/00	10:01:00 PM	397511	7805530	6		3	9	520	30	60	260	450.33	397771	7805980.333	200
CAH148	9	06/23/00	10:09:00 PM	396174	7804080	23			23	315	8	82	43.84	311.93	396217.8395	7804391.934	230
CAH149	9	06/23/00	10:17:00 PM	395450	7803605	3			3	295	285	165	-284.9	76.352	395165.0519	7803681.352	290
CAH150	9	06/23/00	10:23:00 PM	394380	7802749	1		4	5	80	7	83	9.7495	79.404	394389.7495	7802828.404	80
CAH150a	9	06/23/00	10:23:00 PM	394380	7802749	7			7	175	122	328	148.41	-92.74	394528.4084	7802656.264	110
CAH150b	9	06/23/00	10:23:00 PM	394380	7802749	31		1	32	280	236	214	-232.1	-156.6	394147.8695	7802592.426	90
CAH150c	9	06/23/00	10:23:00 PM	394380	7802749	11			11	300	283	167	-292.3	67.485	394087.689	7802816.485	70

## Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH151	9	06/23/00	10:50:00 PM	395996	7800064	210	73		283	825	68	22	764.93	309.05	396760.9267	7800373.05	770
CAH152	9	06/23/00	11:04:00 PM	396453	7799241	36	7		43	350	79	11	343.57	66.783	396796.5695	7799307.783	310
CAH153	9	06/23/00	11:27:00 PM	396109	7796834	239	97	2	338	400	131	319	301.88	-262.4	396410.8838	7796571.576	390
CAH154	9	06/23/00	11:47:00 PM	396350	7799355	18	3	3	24	210	252	198	-199.7	-64.89	396150.2781	7799290.106	200
CAH155	9	06/24/00	12:14:00 AM	399459	7809965	19	3	1	23	325	84	6	323.22	33.972	399782.2196	7809998.972	280
CAH155a	9	06/24/00	12:14:00 AM	399459	7809965	9			9	200	235	215	-163.8	-114.7	399295.1696	7809850.285	110
CAH156	9	06/24/00	12:26:00 AM	399826	7811241	19			19	950	130	320	727.74	-610.6	400553.7422	7810630.352	780
CAH156a	9	06/24/00	12:26:00 AM	399826	7811241	5			5	521	117	333	464.21	-236.5	400290.2144	7811004.471	470
CAH157	9	06/24/00	12:49:00 AM	399322	7798271	57	8		65	900	115	335	815.68	-380.4	400137.677	7797890.644	820
CAH158	9	06/24/00	1:02:00 AM	399136	7798003	67	11		78	450	196	254	-124	-432.6	399011.9632	7797570.432	420
CAH158a	9	06/24/00	1:02:00 AM	399136	7798003	200	65		265	580	301	149	-497.2	298.72	398638.843	7798301.722	640
CAH159	9	06/24/00	2:22:00 AM	392096	7799081	4		4	8	212	29	61	102.78	185.42	392198.7796	7799266.419	210
CAH159a	9	06/24/00	2:22:00 AM	392096	7799081	2			2	330	134	316	237.38	-229.2	392333.3821	7798851.763	90
CAH160	9	06/24/00	2:53:00 AM	389965	7800028	1		2	3	118	18	72	36.464	112.22	390001.464	7800140.225	90
CAH161	9	06/24/00	3:21:00 AM	389589	7800293	199	74	6	279	600	280	170	-590.9	104.19	388998.1153	7800397.189	630
CAH161a	9	06/24/00	3:21:00 AM	389589	7800293	19			19	270	117	333	240.57	-122.6	389829.5718	7800170.423	20
CAH162	9	06/24/00	3:34:00 AM	387958	7801266	2			2	240	11	79	45.794	235.59	388003.7942	7801501.591	240
CAH163	9	06/24/00	3:42:00 AM	612376	7803054			1	1	0	0	90	0	0	612376	7803054	0
CAH164	9	06/24/00	3:47:00 AM	612479	7804266	1			1	312	263	187	-309.7	-38.02	612169.3256	7804227.977	310
CAH165	9	06/24/00	3:56:00 AM	612420	7805132	2			2	333	135	315	235.47	-235.5	612655.4666	7804896.533	260
CAH165a	9	06/24/00	3:56:00 AM	612420	7805132	2			2	950	113	337	874.48	-371.2	613294.4796	7804760.805	890
CAH166	9	06/24/00	4:18:00 AM	612105	7797876	7	1		8	900	303	147	-754.8	490.18	611350.1965	7798366.175	810
CAH167	9	06/24/00	4:25:00 AM	612640	7796000	4			4	358	111	339	334.22	-128.3	612974.2218	7795871.704	340
CAH168	10	06/24/00	7:19:00 AM	408934	7802646	5			5	341	312	138	-253.4	228.17	408680.5876	7802874.174	130
CAH169	10	06/24/00	7:29:00 AM	409622	7803837	2			2	710	242	208	-626.9	-333.3	408995.1072	7803503.675	660
CAH170	10	06/24/00	7:37:00 AM	409614	7804807	7	1		8	560	296	154	-503.3	245.49	409110.6753	7805052.488	360
CAH171	10	06/24/00	7:46:00 AM	409503	7805671			2	2	621	40	50	399.17	475.71	409902.1711	7806146.714	600
CAH172	10	06/24/00	7:57:00 AM	409011	7807229			3	3	183	280	170	-180.2	31.778	408830.7802	7807260.778	170
CAH173	10	06/24/00	8:04:00 AM	408983	7807877			4	4	119	62	28	105.07	55.867	409088.0708	7807932.867	110
CAH174	10	06/24/00	8:12:00 AM	409004	7808877	5			5	575	312	138	-427.3	384.75	408576.6917	7809261.75	440
CAH175	10	06/24/00	8:25:00 AM	409027	7809212	26	8		34	133	272	178	-132.9	4.6416	408894.081	7809216.642	120
CAH176	10	06/24/00	8:34:00 AM	409565	7811096	10			10	58	8	82	8.072	57.436	409573.072	7811153.436	20
CAH178	10	06/24/00	8:51:00 AM	408860	7814491	5			5	221	70	20	207.67	75.586	409067.6721	7814566.586	220
CAH179	10	06/24/00	9:38:00 AM	411319	7815114			1	1	675	176	274	47.086	-673.4	411366.0856	7814440.644	670
CAH180	10	06/24/00	9:52:00 AM	413604	7814943	1			1	133	12	78	27.652	130.09	413631.6523	7815073.094	110
CAH181	10	06/24/00	10:04:00 AM	413605	7814724	5	5		10	975	212	238	-516.7	-826.8	413088.3287	7813897.153	920
CAH182	10	06/24/00	10:23:00 AM	408189	7818894	2			2	269	261	189	-265.7	-42.08	407923.3118	7818851.919	210
CAH183	10	06/24/00	10:36:00 AM	406840	7818912	2		1	3	0	0	90	0	0	406840	7818912	0
CAH184	10	06/24/00	10:57:00 AM	404540	7816546	3			3	242	248	202	-224.4	-90.65	404315.6215	7816455.345	220
CAH185	10	06/24/00	11:36:00 AM	407145	7820470			2	2	775	72	18	737.07	239.49	407882.0688	7820709.488	770
CAH186	10	06/24/00	11:46:00 AM	406048	7821176	8	1		9	246	308	142	-193.9	151.45	405854.1494	7821327.453	180
CAH187	10	06/24/00	12:23:00 PM	409630	7803812	4			4	925	200	250	-316.4	-869.2	409313.6314	7802942.784	110
CAH188	10	06/24/00	12:31:00 PM	411955	7803221	5			5	156	32	58	82.667	132.3	412037.6674	7803353.296	120
CAH189	10	06/24/00	12:37:00 PM	413492	7802929	1			1	327	18	72	101.05	311	413593.0486	7803239.895	310



## Appendix A (continued)

Wypt	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH190	10	06/24/00	12:46:00 PM	416627	7802683	3		1	4	382	346	104	-92.41	370.65	416534.5858	7803053.653	380
CAH191	10	06/24/00	10:24:00 PM	401646	7804315	1		2	3	192	354	96	-20.07	190.95	401625.9305	7804505.948	10
CAH192	10	06/24/00	10:34:00 PM	397419	7805378	1		1	2	138	295	155	-125.1	58.321	397293.9295	7805436.321	140
CAH193	10	06/24/00	11:01:00 PM	387159	7800708	2			2	85	166	284	20.563	-82.48	387179.5634	7800625.525	180
CAH194	10	06/24/00	11:12:00 PM	611812	7800766			1	1	192	194	256	-46.45	-186.3	611765.551	7800679.703	190
CAH194a	10	06/24/00	11:12:00 PM	611812	7800766	1			1	259	281	169	-254.2	49.42	611557.7586	7800815.42	180
CAH195	10	06/24/00	11:30:00 PM	607736	7796357	2	1		3	260	140	310	167.12	-199.2	607903.1248	7796157.828	250
CAH196	10	06/24/00	11:53:00 PM	604685	7792731	1			1	0	0	90	0	0	604685	7792731	0
CAH197	10	06/25/00	12:42:00 AM	601579	7791549			1	1	0	0	90	0	0	601579	7791549	0
CAH198	10	06/25/00	12:55:00 AM	607132	7795581			2	2	50	331	119	-24.24	43.731	607107.7595	7795624.731	40
CAH199	10	06/25/00	1:23:00 AM	612259	7802430	2			2	55	271	179	-54.99	0.9599	612204.0084	7802430.96	10
CAH200	10	06/25/00	2:08:00 AM	389850	7804200	2			2	231	7	83	28.152	229.28	389878.1518	7804429.278	160
CAH201	10	06/25/00	2:29:00 AM	392648	7807428	2		5	7	110	167	283	24.745	-107.2	392672.7446	7807320.819	110
CAH202	10	06/25/00	2:39:00 AM	393284	7807781	1			1	236	134	316	169.78	-163.9	393453.7842	7807617.061	220
CAH203	10	06/25/00	3:29:00 AM	see notepad		518	79	13	610	400	278	172	-396.1	55.669	399103	7804970	390
CAH204	11	06/25/00	7:20:00 AM	409258	7802754			6	6	26	138	312	17.397	-19.32	409275.3974	7802734.678	30
CAH205	11	06/25/00	7:47:00 AM	409636	7805495	10		4	14	1000	320	130	-642.8	766.04	408993.2124	7806261.044	260
CAH206	11	06/25/00	7:55:00 AM	409266	7806205	7		2	9	150	222	228	-100.4	-111.5	409165.6304	7806093.528	130
CAH207	11	06/25/00	8:01:00 AM	409161	7806647	1			1	27	342	108	-8.343	25.679	409152.6565	7806672.679	10
CAH208	11	06/25/00	8:05:00 AM	409075	7806986	121	21	17	159	950	158	292	355.88	-880.8	409430.8763	7806105.175	140
CAH209	11	06/25/00	8:37:00 AM	408977	7807501	10	6		16	900	286	164	-865.1	248.07	408111.8645	7807749.074	860
CAH210	11	06/25/00	8:46:00 AM	408981	7807788	14	7	1	22	185	90	0	185	0	409166	7807788	180
CAH211	11	06/25/00	8:55:00 AM	408982	7807851	19	8	1	28	147	320	130	-94.49	112.61	408887.5102	7807963.609	100
CAH212	11	06/25/00	9:04:00 AM	408993	7808311	36	11		47	975	48	42	724.57	652.4	409717.5662	7808963.402	710
CAH213	11	06/25/00	9:12:00 AM	409077	7809305	3			3	42	40	50	26.997	32.174	409103.9971	7809337.174	0
CAH214	11	06/25/00	9:17:00 AM	409510	7810130	1			1	32	56	34	26.529	17.894	409536.5292	7810147.894	20
CAH215	11	06/25/00	9:27:00 AM	409614	7810863	2		1	3	205	76	14	198.91	49.594	409812.9106	7810912.594	210
CAH216	11	06/25/00	9:33:00 AM	409516	7811334	4		7	11	134	64	26	120.44	58.742	409636.4384	7811392.742	130
CAH217	11	06/25/00	9:44:00 AM	409541	7812412	4		2	6	190	272	178	-189.9	6.6309	409351.1157	7812418.631	150
CAH218	11	06/25/00	9:50:00 AM	409531	7812512			3	3	32	26	64	14.028	28.761	409545.0279	7812540.761	0
CAH219	11	06/25/00	10:14:00 AM	408952	7817515	27		4	31	85	270	180	-85	1E-14	408867	7817515	90
CAH220	11	06/25/00	10:27:00 AM	408944	7817222	22	2	3	27	141	176	274	9.8357	-140.7	408953.8357	7817081.343	10
CAH221	11	06/25/00	10:44:00 AM	408596	7815757			9	9	0	0	90	0	0	408596	7815757	0
CAH222	11	06/25/00	8:12:00 PM	417475	7800679	1			1	514	294	156	-469.6	209.06	417005.4376	7800888.063	260
CAH223	11	06/25/00	9:05:00 PM	415506	7802371	2		3	5	25	223	227	-17.05	-18.28	415488.95	7802352.716	20
CAH224	11	06/25/00	9:40:00 PM	412128	7803237	197	89	5	291	100	270	180	-100	1E-14	412028	7803237	0
CAH225	11	06/25/00	11:12:00 PM	399174	7800975	1			1	750	258	192	-733.6	-155.9	398440.3893	7800819.066	720
CAH226	11	06/25/00	11:43:00 PM	398238	7805755			1	1	75	348	102	-15.59	73.361	398222.4066	7805828.361	70
CAH227	11	06/26/00	12:37:00 AM	395051	7820315			1	1	325	251	199	-307.3	-105.8	394743.7085	7820209.19	390
CAH228	11	06/26/00	12:50:00 AM	395857	7820241	2		2	4	410	163	287	119.87	-392.1	395976.8724	7819848.915	410
CAH229	11	06/26/00	1:05:00 AM	394848	7816888	9			9	355	250	200	-333.6	-121.4	394514.4091	7816766.583	340
CAH230	11	06/26/00	1:24:00 AM	396541	7817368	4		8	12	598	5	85	52.119	595.72	396593.1191	7817963.724	530
CAH231	11	06/26/00	1:39:00 AM	398525	7819098	1			1	146	308	142	-115	89.887	398409.9504	7819187.887	120
CAH232	11	06/26/00	1:48:00 AM	398820	7819145	1			1	267	111	339	249.27	-95.68	399069.266	7819049.316	180

Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH232a	11	06/26/00	1:48:00 AM	398820	7819145			2	2	395	67	23	363.6	154.34	399183.5994	7819299.339	0
CAH233	11	06/26/00	2:25:00 AM	396053	7817202	10			10	75	162	288	23.176	-71.33	396076.1763	7817130.671	70
CAH234	11	06/26/00	3:24:00 AM	390229	7816042	1			1	950	285	165	-917.6	245.88	389311.3705	7816287.878	810
CAH235	11	06/26/00	3:58:00 AM	391189	7813280			1	1	0	0	90	0	0	391189	7813280	0
CAH236	11	06/26/00	4:19:00 AM	388999	7810540	2		1	3	297	227	223	-217.2	-202.6	388781.788	7810337.446	290
CAH237	11	06/26/00	4:45:00 AM	397056	7807664	1			1	492	234	216	-398	-289.2	396657.9636	7807374.81	500
CAH238	11	06/26/00	5:01:00 AM	399683	7804725	1	1		2	468	219	231	-294.5	-363.7	399388.4781	7804361.296	280
CAH240	12	06/26/00	7:31:00 AM	403978	7802939	1		2	3	445	66	24	406.53	181	404384.5277	7803119.998	430
CAH241	12	06/26/00	7:47:00 AM	404493	7802355	2		2	4	800	230	220	-612.8	-514.2	403880.1644	7801840.77	790
CAH241a	12	06/26/00	7:47:00 AM	404493	7802355			2	2	410	126	324	331.7	-241	404824.697	7802114.008	90
CAH242	12	06/26/00	8:11:00 AM	404866	7801914	3		7	10	600	217	233	-361.1	-479.2	404524.911	7801434.819	580
CAH243	12	06/26/00	8:20:00 AM	405778	7801278	2		3	5	25	211	239	-12.88	-21.43	405765.124	7801256.571	30
CAH244	12	06/26/00	8:44:00 AM	406458	7801399	26	1	1	28	0	0	90	0	0	406458	7801399	10
CAH244a	12	06/26/00	8:44:00 AM	406458	7801399	300	1	50	351	494	28	62	231.92	436.18	406689.919	7801835.176	290
CAH245	12	06/26/00	9:04:00 AM	407204	7801710	101		14	115	238	171	279	37.231	-235.1	407241.2314	7801474.93	230
CAH246	12	06/26/00	9:30:00 AM	407784	7801926	6		1	7	39	161	289	12.697	-36.88	407796.6972	7801889.125	40
CAH246a	12	06/26/00	9:30:00 AM	407784	7801926	110	5	3	118	427	134	316	307.16	-296.6	408091.1581	7801629.381	390
CAH246b	12	06/26/00	9:30:00 AM	407784	7801926	307	10	9	326	496	8	82	69.03	491.17	407853.0299	7802417.173	420
CAH247	12	06/26/00	10:24:00 AM	408862	7802626	202	8	25	235	450	124	326	373.07	-251.6	409235.0669	7802374.363	310
CAH248	12	06/26/00	10:49:00 AM	409507	7803047	503	19	77	599	0	0	90	0	0	409507	7803047	0
CAH249	12	06/26/00	11:11:00 AM	409609	7803880	1613	129	258	2000	0	0	90	0	0	409609	7803880	0
CAH250	12	06/26/00	11:58:00 AM	409334	7805936	290	14	40	344	0	0	90	0	0	409334	7805936	0
CAH251	12	06/26/00	12:49:00 PM	409032	7807168	240	80	15	335	108	258	192	-105.6	-22.45	408926.3601	7807145.546	110
CAH252	12	06/26/00	1:41:00 PM	408999	7808559	66	5	38	109	0	0	90	0	0	408999	7808559	0
CAH253	12	06/26/00	2:16:00 PM	409662	7810576	162	22		184	900	101	349	883.46	-171.7	410545.4645	7810404.272	910
CAH254	12	06/26/00	3:04:00 PM	408922	7814187	35	2	14	51	0	0	90	0	0	408922	7814187	0
CAH255	12	06/26/00	3:38:00 PM	408646	7816015	212	39	6	257	534	268	182	-533.7	-18.64	408112.3253	7815996.364	490
CAH256	12	06/26/00	4:11:00 PM	410311	7803320	1		1	2	800	192	258	-166.3	-782.5	410144.6706	7802537.482	810
CAH257	12	06/26/00	4:21:00 PM	411619	7803203	1			1	309	204	246	-125.7	-282.3	411493.3184	7802920.714	270
CAH257a	12	06/26/00	4:21:00 PM	411619	7803203	1			1	0	0	90	0	0	411619	7803203	0
CAH258	12	06/26/00	4:36:00 PM	416271	7802572	1			1	0	0	90	0	0	416271	7802572	0
CAH259	12	06/27/00	12:20:00 AM	402973	7821860	1		1	2	195	204	246	-79.31	-178.1	402893.6864	7821681.859	180
CAH260	12	06/27/00	12:27:00 AM	403573	7821645			1	1	30	4	86	2.0927	29.927	403575.0927	7821674.927	30
CAH261	12	06/27/00	12:48:00 AM	407187	7820314	3		9	12	373	260	190	-367.3	-64.77	406819.6667	7820249.229	380
CAH262	12	06/27/00	12:54:00 AM	407429	7819691	16			16	390	251	199	-368.8	-127	407060.2478	7819564.028	390
CAH263	12	06/27/00	1:06:00 AM	407472	7819165			2	2	143	358	92	-4.991	142.91	407467.0094	7819307.913	140
CAH263a	12	06/26/00	4:21:00 PM	407472	7819165	25		3	28	201	175	275	17.518	-200.2	407489.5183	7818964.765	190
CAH264	12	06/27/00	1:22:00 AM	406500	7818579	11		3	14	140	134	316	100.71	-97.25	406600.7076	7818481.748	130
CAH264a	12	06/27/00	1:22:00 AM	406500	7818579	13		10	23	251	261	189	-247.9	-39.27	406252.0902	7818539.735	0
CAH264b	12	06/27/00	1:22:00 AM	406500	7818579	21		13	34	403	281	169	-395.6	76.896	406104.4042	7818655.896	120
CAH265	12	06/27/00	1:36:00 AM	405143	7816437	5			5	750	182	268	-26.17	-749.5	405116.8254	7815687.457	710
CAH266	12	06/27/00	1:48:00 AM	404024	7817713	1		1	2	263	259	191	-258.2	-50.18	403765.8321	7817662.817	260
CAH267	12	06/27/00	2:30:00 AM	410933	7820011	1			1	65	47	43	47.538	44.33	410980.538	7820055.33	50
CAH268	12	06/27/00	2:39:00 AM	412033	7818659	2			2	800	243	207	-712.8	-363.2	411320.1948	7818295.808	570

## Appendix A (continued)

Wypst	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH269	12	06/27/00	3:07:00 AM	411163	7815196	4			4	0	0	90	0	0	411163	7815196	0
CAH270	12	06/27/00	3:19:00 AM	413666	7814754	3	2		5	550	70	20	516.83	188.11	414182.8309	7814942.111	520
CAH270a	12	06/27/00	3:19:00 AM	413666	7814754	39	19		58	900	171	279	140.79	-888.9	413806.791	7813865.08	870
CAH271	12	06/27/00	3:30:00 AM	411815	7815019	83			83	730	196	254	-201.2	-701.7	411613.7847	7814317.279	730
CAH272	12	06/27/00	3:50:00 AM	408645	7816019	1			1	204	116	334	183.35	-89.43	408828.354	7815929.572	210
CAH273	12	06/27/00	4:01:00 AM	408869	7814419	1		1	2	850	101	349	834.38	-162.2	409703.3831	7814256.812	280
CAH274	12	06/27/00	4:19:00 AM	409121	7813201	249	22	5	276	835	267	183	-833.9	-43.7	408287.1443	7813157.299	830
CAH275	12	06/27/00	4:24:00 AM	409399	7812663	1			1	73	64	26	65.612	32.001	409464.612	7812695.001	60
CAH276	12	06/27/00	4:37:00 AM	409526	7811722	17	11		28	385	116	334	346.04	-168.8	409872.0357	7811553.227	360
CAH277	12	06/27/00	5:14:00 AM	408973	7807670	351	132	14	497	260	284	166	-252.3	62.9	408720.7231	7807732.9	260
CAH278	12	06/27/00	5:33:00 AM	409039	7807123	11	5	22	38	0	0	90	0	0	409039	7807123	0
CAH278a	12	06/27/00	5:33:00 AM	409039	7807123	78	24		102	325	82	8	321.84	45.231	409360.8371	7807168.231	320
CAH279	13	06/27/00	8:42:00 AM	403075	7803833	2		3	5	162	216	234	-95.22	-131.1	402979.7788	7803701.939	140
CAH280	13	06/27/00	8:53:00 AM	403320	7803593	4		7	11	205	242	208	-181	-96.24	403138.9957	7803496.758	190
CAH280a	13	06/27/00	8:53:00 AM	403320	7803593	19		16	35	360	136	314	250.08	-259	403570.077	7803334.038	10
CAH280b	13	06/27/00	8:53:00 AM	403320	7803593	2		3	5	411	50	40	314.84	264.19	403634.8443	7803857.186	340
CAH281	13	06/27/00	9:07:00 AM	403718	7803200	25		14	39	268	44	46	186.17	192.78	403904.1684	7803392.783	260
CAH281a	13	06/27/00	9:07:00 AM	403718	7803200	30		21	51	850	178	272	29.665	-849.5	403747.6646	7802350.518	550
CAH282	13	06/27/00	9:35:00 AM	403951	7802967	2		3	5	94	56	34	77.93	52.564	404028.9295	7803019.564	90
CAH282a	13	06/27/00	9:35:00 AM	403951	7802967	1			1	176	226	224	-126.6	-122.3	403824.3962	7802844.74	170
CAH282b	13	06/27/00	9:35:00 AM	403951	7802967	1			1	277	178	272	9.6672	-276.8	403960.6672	7802690.169	170
CAH282c	13	06/27/00	9:35:00 AM	403951	7802967	2		3	5	590	102	348	577.11	-122.7	404528.1071	7802844.332	350
CAH283	13	06/27/00	9:46:00 AM	404472	7802375	1		1	2	3	196	254	-0.827	-2.884	404471.1731	7802372.116	10
CAH283a	13	06/27/00	9:46:00 AM	404472	7802375	4		2	6	238	132	318	176.87	-159.3	404648.8685	7802215.747	30
CAH284	13	06/27/00	9:55:00 AM	404822	7801979	1		5	6	71	48	42	52.763	47.508	404874.7633	7802026.508	60
CAH285	13	06/27/00	10:06:00 AM	405295	7801441	8		17	25	343	213	237	-186.8	-287.7	405108.1888	7801153.336	300
CAH286	13	06/27/00	10:16:00 AM	405973	7801302	5		5	10	193	16	74	53.198	185.52	406026.198	7801487.524	170
CAH287	13	06/27/00	10:46:00 AM	407116	7801681	7	1	1	9	53	2	88	1.8497	52.968	407117.8497	7801733.968	40
CAH287a	13	06/27/00	10:46:00 AM	407116	7801681	11		5	16	85	156	294	34.573	-77.65	407150.5726	7801603.349	80
CAH287b	13	06/27/00	10:46:00 AM	407116	7801681	2		1	3	800	156	294	325.39	-730.8	407441.3893	7800950.164	800
CAH287c	13	06/27/00	10:46:00 AM	407116	7801681	49	10	18	77	231	45	45	163.34	163.34	407279.3417	7801844.342	100
CAH288	13	06/27/00	10:58:00 AM	408435	7802340	5			5	81	259	191	-79.51	-15.46	408355.4882	7802324.544	30
CAH288a	13	06/27/00	10:58:00 AM	408435	7802340	4		1	5	92	16	74	25.359	88.436	408460.3586	7802428.436	40
CAH288b	13	06/27/00	10:58:00 AM	408435	7802340	6			6	402	64	26	361.32	176.23	408796.3152	7802516.225	10
CAH289	13	06/27/00	11:14:00 AM	408860	7802636	3	1		4	418	317	133	-285.1	305.71	408574.9247	7802941.706	130
CAH290	13	06/27/00	11:24:00 AM	409703	7803371	39	12	2	53	446	324	126	-262.2	360.82	409440.8478	7803731.822	190
CAH290a	13	06/27/00	11:24:00 AM	409703	7803371	17			17	360	140	310	231.4	-275.8	409934.4035	7803095.224	360
CAH291	13	06/27/00	11:44:00 AM	410172	7803361	23	5	4	32	570	190	260	-98.98	-561.3	410073.0205	7802799.66	550
CAH292	13	06/27/00	12:02:00 PM	411010	7803157	32	1	16	49	120	39	51	75.518	93.258	411085.5184	7803250.258	80
CAH293	13	06/27/00	12:13:00 PM	411681	7803200	18	2		18	200	174	276	20.906	-198.9	411701.9057	7803001.096	200
CAH294	13	06/27/00	12:22:00 PM	412382	7803249	2		5	7	168	190	260	-29.17	-165.4	412352.8271	7803083.552	160
CAH295	13	06/27/00	12:33:00 PM	413286	7803062	3		1	4	132	8	82	18.371	130.72	413304.3708	7803192.715	120
CAH296	13	06/27/00	12:43:00 PM	413742	7802813	15		24	39	0	0	90	0	0	413742	7802813	0
CAH297	13	06/27/00	12:56:00 PM	414235	7802725	5		9	14	176	176	274	12.277	-175.6	414247.2771	7802549.429	180

## Appendix A (continued)

Wypt	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH298	13	06/27/00	1:11:00 PM	415969	7802475	11		3	14	120	354	96	-12.54	119.34	415956.4566	7802594.343	110
CAH298a	13	06/27/00	1:11:00 PM	415969	7802475	5		1	6	700	358	92	-24.43	699.57	415944.5704	7803174.574	670
CAH299	13	06/27/00	3:08:00 PM	400921	7803897	2		1	3	150	278	172	-148.5	20.876	400772.4598	7803917.876	130
CAH299a	13	06/27/00	3:08:00 PM	400921	7803897	21		4	25	177	151	299	85.811	-154.8	401006.8113	7803742.192	150
CAH300	13	06/27/00	3:16:00 PM	400555	7803401	15	1		16	252	159	291	90.309	-235.3	400645.3087	7803165.738	200
CAH300a	13	06/27/00	3:16:00 PM	400555	7803401			2	2	900	272	178	-899.5	31.41	399655.5483	7803432.41	770
CAH301	13	06/27/00	3:37:00 PM	400062	7802351	7		1	8	143	156	294	58.163	-130.6	400120.1633	7802220.363	100
CAH301a	13	06/27/00	3:37:00 PM	400062	7802351			1	1	341	192	258	-70.9	-333.5	399991.1021	7802017.452	70
CAH302	13	06/27/00	3:45:00 PM	399670	7801712	4		2	6	133	133	317	97.27	-90.71	399767.27	7801621.294	140
CAH302a	13	06/27/00	3:45:00 PM	399670	7801712	3			3	338	104	346	327.96	-81.77	399997.96	7801630.23	320
CAH302b	13	06/27/00	3:45:00 PM	399670	7801712	30			30	900	310	140	-689.4	578.51	398980.56	7802290.509	890
CAH303	13	06/27/00	4:06:00 PM	399453	7801416	25	5	1	31	569	276	174	-565.9	59.477	398887.117	7801475.477	270
CAH303a	13	06/27/00	4:06:00 PM	399453	7801416	22	6		28	800	330	120	-400	692.82	399053	7802108.82	730
CAH304	13	06/27/00	4:21:00 PM	399303	7800715	80	21	4	105	600	126	324	485.41	-352.7	399788.4102	7800362.329	850
CAH305	13	06/27/00	4:32:00 PM	399038	7800393	26	2	9	37	305	260	190	-300.4	-52.96	398737.6336	7800340.037	270
CAH306	13	06/27/00	4:41:00 PM	399002	7799877	33	9	1	43	170	224	226	-118.1	-122.3	398883.9081	7799754.712	120
CAH307	13	06/27/00	4:54:00 PM	399333	7798517	32	3	2	37	195	114	336	178.14	-79.31	399511.1414	7798437.686	180
CAH309	13	06/28/00	12:24:00 AM	403636	7804652	6		1	7	220	277	173	-218.4	26.811	403417.6398	7804678.811	210
CAH310	13	06/28/00	12:35:00 AM	404248	7804139	31	12	1	44	0	0	90	0	0	404248	7804139	0
CAH311	13	06/28/00	12:51:00 AM	402980	7805497	32	4		36	850	264	186	-845.3	-88.85	402134.6564	7805408.101	650
CAH312	13	06/28/00	12:58:00 AM	402622	7805870	4			4	337	339	111	-120.8	314.62	402501.23	7806184.617	220
CAH313	13	06/28/00	1:12:00 AM	403504	7805941	3	2		5	131	81	9	129.39	20.493	403633.3872	7805961.493	140
CAH313a	13	06/28/00	1:12:00 AM	403504	7805941	93	31		124	816	62	28	720.49	383.09	404224.4852	7806324.089	810
CAH314	13	06/28/00	1:20:00 AM	402409	7807413	7	3		10	465	251	199	-439.7	-151.4	401969.3339	7807261.611	440
CAH315	13	06/28/00	1:25:00 AM	402404	7807538	2	1		3	281	287	163	-268.7	82.156	402135.2784	7807620.156	250
CAH316	13	06/28/00	1:48:00 AM	401966	7803408	3		1	4	865	102	348	846.1	-179.8	402812.0977	7803228.156	610
CAH317	13	06/28/00	1:53:00 AM	401977	7802812	2			2	210	265	185	-209.2	-18.3	401767.7991	7802793.697	200
CAH318	13	06/28/00	2:04:00 AM	402519	7801190	2			2	530	135	315	374.77	-374.8	402893.7666	7800815.233	10
CAH319	13	06/28/00	2:09:00 AM	402038	7801987	2			2	411	279	171	-405.9	64.295	401632.0601	7802051.295	410
CAH322	13	06/28/00	2:46:00 AM	399480	7804638	20		6	26	305	351	99	-47.71	301.24	399432.2875	7804939.245	70
CAH322a	13	06/28/00	2:46:00 AM	399480	7804638	30	8		38	280	246	204	-255.8	-113.9	399224.2073	7804524.114	260
CAH321	13	06/28/00	2:52:00 AM	400516	7804540	7	5		12	127	358	92	-4.432	126.92	400511.5678	7804666.923	120
CAH320	13	06/28/00	2:55:00 AM	401117	7804408	41	7	3	51	430	42	48	287.73	319.55	401404.7262	7804727.552	260
CAH320a	13	06/28/00	2:55:00 AM	401117	7804408	9	3		12	650	338	112	-243.5	602.67	400873.5057	7805010.67	580
CAH323	13	06/28/00	3:02:00 AM	399725	7805191	3			3	0	0	90	0	0	399725	7805191	0
CAH324	13	06/28/00	3:06:00 AM	399736	7805336	5	2		7	300	275	175	-298.9	26.147	399437.1416	7805362.147	60
CAH325	13	06/28/00	3:21:00 AM	400048	7807046	25	15		40	0	0	90	0	0	400048	7807046	0
CAH325a	13	06/28/00	3:21:00 AM	400048	7807046	24	21		45	325	8	82	45.231	321.84	400093.2313	7807367.837	110
CAH326	13	06/28/00	3:38:00 AM	399627	7808305	20	9	3	32	0	0	90	0	0	399627	7808305	0
CAH327	13	06/28/00	3:48:00 AM	399623	7811157	6			6	135	326	124	-75.49	111.92	399547.509	7811268.92	60
CAH328	13	06/28/00	4:07:00 AM	398413	7805551	15	3		18	256	192	258	-53.23	-250.4	398359.7746	7805300.594	250
CAH329	13	06/28/00	4:13:00 AM	398148	7805705	4		2	6	235	300	150	-203.5	117.5	397944.484	7805822.5	180
CAH330	13	06/28/00	4:20:00 AM	397517	7805544	2			2	330	299	151	-288.6	159.99	397228.3755	7805703.987	320
CAH331	13	06/28/00	4:26:00 AM	397119	7804880	2			2	160	248	202	-148.3	-59.94	396970.6506	7804820.063	90

## Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH331a	13	06/28/00	4:26:00 AM	397119	7804880	1			1	150	13	77	33.743	146.16	397152.7427	7805026.156	130
CAH331b	13	06/28/00	4:26:00 AM	397119	7804880	15			15	275	176	274	19.183	-274.3	397138.183	7804605.67	160
CAH332	13	06/28/00	4:36:00 AM	396182	7804034	7			7	105	70	20	98.668	35.912	396260.6677	7804069.912	80
CAH333	13	06/28/00	4:43:00 AM	396390	7803515	24	5		29	350	181	269	-6.108	-349.9	396383.8917	7803165.053	300
CAH334	14	06/28/00	7:41:00 AM	409506	7812482	1			1	669	59	31	573.44	344.56	410079.4449	7812826.56	550
CAH335	14	06/28/00	7:51:00 AM	408981	7813899	1			1	29	85	5	28.89	2.5275	409009.8896	7813901.528	30
CAH336	14	06/28/00	8:03:00 AM	408821	7817903	5		1	6	344	294	156	-314.3	139.92	408506.7404	7818042.917	190
CAH336a	14	06/28/00	8:03:00 AM	408821	7817903	1		1	2	327	221	229	-214.5	-246.8	408606.4687	7817656.21	310
CAH337	14	06/28/00	8:56:00 AM	404341	7821520			5	5	46	28	62	21.596	40.616	404362.5957	7821560.616	30
CAH338	14	06/28/00	9:28:00 AM	404858	7816368	1			1	324	170	280	56.262	-319.1	404914.262	7816048.922	320
CAH339	14	06/28/00	9:53:00 AM	409207	7816906	2			2	255	26	64	111.78	229.19	409318.7846	7817135.192	230
CAH340	14	06/28/00	10:06:00 AM	411697	7815061	1		1	2	102	191	259	-19.46	-100.1	411677.5375	7814960.874	100
CAH340a	14	06/28/00	10:06:00 AM	411697	7815061	1			1	335	45	45	236.88	236.88	411933.8808	7815297.881	280
CAH341	14	06/28/00	11:09:00 AM	410496	7803272	5			5	600	174	276	62.717	-596.7	410558.7171	7802675.287	560
CAH342	14	06/28/00	11:14:00 AM	411096	7803159	2	2		4	100	20	70	34.202	93.969	411130.202	7803252.969	90
CAH343	14	06/28/00	11:20:00 AM	411676	7803208	32	13		45	182	25	65	76.917	164.95	411752.9165	7803372.948	160
CAH344	14	06/28/00	11:29:00 AM	412355	7803249	13	3		16	177	25	65	74.803	160.42	412429.8034	7803409.416	140
CAH345	14	06/28/00	11:43:00 AM	413038	7803212	37	15		52	483	58	32	409.61	255.95	413447.6072	7803467.951	430
CAH346	14	06/28/00	11:57:00 AM	416009	7802481	5	4		9	219	208	242	-102.8	-193.4	415906.1857	7802287.634	150
CAH347	14	06/28/00	12:13:00 PM	417861	7800699	2			2	317	301	149	-271.7	163.27	417589.278	7800862.267	180
CAH348	14	06/28/00	12:41:00 PM	407455	7801807	7			7	700	139	311	459.24	-528.3	407914.2413	7801278.703	650
CAH349	14	06/28/00	12:48:00 PM	405920	7801300	4			4	402	198	252	-124.2	-382.3	405795.7752	7800917.675	70
CAH350	14	06/28/00	12:55:00 PM	404982	7801834			1	1	0	0	90	0	0	404982	7801834	0
CAH351	14	06/28/00	1:07:00 PM	403955	7802973	49	19		68	230	50	40	176.19	147.84	404131.1902	7803120.841	230
CAH352	14	06/29/00	12:36:00 AM	395961	7804008	2		4	6	90	271	179	-89.99	1.5707	395871.0137	7804009.571	30
CAH353	14	06/29/00	12:44:00 AM	395224	7803234	2			2	75	248	202	-69.54	-28.1	395154.4612	7803205.905	40
CAH353a	14	06/29/00	12:44:00 AM	395224	7803234	2			2	360	358	92	-12.56	359.78	395211.4362	7803593.781	200
CAH354	14	06/29/00	12:50:00 AM	394382	7802724	14			14	90	206	244	-39.45	-80.89	394342.5466	7802643.109	90
CAH354a	14	06/29/00	12:50:00 AM	394382	7802724	12	3		15	375	168	282	77.967	-366.8	394459.9669	7802357.195	410
CAH355	14	06/29/00	1:15:00 AM	392829	7803560	126	80	2	208	310	73	17	296.45	90.635	393125.4545	7803650.635	10
CAH356	14	06/29/00	1:22:00 AM	392926	7804948	2	2		4	737	267	183	-736	-38.57	392190.01	7804909.428	720
CAH357	14	06/29/00	1:38:00 AM	393144	7805325	2	2		4	850	87	3	848.84	44.486	393992.8351	7805369.486	830
CAH358	14	06/29/00	1:52:00 AM	392731	7801751	24	2		26	230	64	26	206.72	100.83	392937.7226	7801851.825	110
CAH358a	14	06/29/00	1:52:00 AM	392731	7801751	12	3		15	900	95	355	896.58	-78.44	393627.5752	7801672.56	660
CAH359	14	06/29/00	1:58:00 AM	393060	7801281	7	2		9	110	173	277	13.406	-109.2	393073.4056	7801171.82	110
CAH360	14	06/29/00	2:12:00 AM	394221	7800551	12	5		17	760	244	206	-683.1	-333.2	393537.9165	7800217.838	730
CAH361	14	06/29/00	2:31:00 AM	396072	7796832	13	2		15	950	189	261	-148.6	-938.3	395923.3873	7795893.696	940
CAH362	14	06/29/00	2:51:00 AM	392477	7801352	6			6	108	288	162	-100.8	32.756	392376.188	7801384.756	60
CAH362a	14	06/29/00	2:51:00 AM	392477	7801352	1			1	264	98	352	261.43	-36.74	392738.4308	7801315.258	70
CAH363	14	06/29/00	3:01:00 AM	391051	7799728	20	3		23	330	172	278	45.927	-326.8	391096.9271	7799401.212	160
CAH364	14	06/29/00	3:07:00 AM	391872	7799171	1	1		2	87	44	46	60.435	62.583	391932.4353	7799233.583	50
CAH365	14	06/29/00	3:15:00 AM	392427	7798764	4	3		7	487	34	56	272.33	403.74	392699.3269	7799167.741	470
CAH365a	14	06/29/00	3:15:00 AM	392427	7798764	9	1		10	777	82	8	769.44	108.14	393196.4383	7798872.137	760
CAH366	14	06/29/00	3:25:00 AM	392387	7798371	23	6		29	610	199	251	-198.6	-576.8	392188.4034	7797794.234	570

Appendix A (continued)

Wyp#	Obs Day	Date	Time (AK)	East	North	Cow	Calf	Bull	Tot#	Range	Bear	Trig	Off X	Off Y	X 2	Y 2	Dist
CAH367	14	06/29/00	3:34:00 AM	390710	7799603	5			5	110	231	219	-85.49	-69.23	390624.5139	7799533.775	40
CAH368	14	06/29/00	3:42:00 AM	389956	7798282	8			8	174	225	225	-123	-123	389832.9634	7798158.963	70
CAH368a	14	06/29/00	3:42:00 AM	389956	7798282	1			1	205	33	57	111.65	171.93	390067.651	7798453.927	60
CAH369	14	06/29/00	3:51:00 AM	389722	7797340	21	6		27	570	67	23	524.69	222.72	390246.6878	7797562.717	510
CAH369a	14	06/29/00	3:51:00 AM	389722	7797340	19	2		21	680	161	289	221.39	-643	389943.3863	7796697.047	300
CAH370	14	06/29/00	3:57:00 AM	389610	7796874	51	7		58	350	219	231	-220.3	-272	389389.7379	7796601.999	280
CAH371	14	06/29/00	4:07:00 AM	390255	7799747	4		5	9	228	5	85	19.872	227.13	390274.8715	7799974.132	210
CAH372	14	06/29/00	4:14:00 AM	389351	7800962	1		1	2	84	191	259	-16.03	-82.46	389334.972	7800879.543	80
CAH373	14	06/29/00	4:21:00 AM	388958	7801210	13	8		21	950	327	123	-517.4	796.74	388440.5929	7802006.737	870
CAH374	14	06/29/00	4:29:00 AM	387219	7801089	1			1	240	202	248	-89.91	-222.5	387129.0944	7800866.476	120
CAH375	14	06/29/00	4:38:00 AM	612233	7798655	11	3		14	478	235	215	-391.6	-274.2	611841.4453	7798380.83	380
CAH376	14	06/29/00	4:53:00 AM	612586	7796253	67	16		83	950	102	348	929.24	-197.5	613515.2402	7796055.484	890
CAH377	14	06/29/00	5:00:00 AM	612525	7795395	4			4	413	185	265	-36	-411.4	612489.0047	7794983.572	390
CAH378	14	06/29/00	5:16:00 AM	612410	7802707	4	2		6	232	53	37	185.28	139.62	612595.2834	7802846.621	220
CAH379	15	06/29/00	7:29:00 AM	399535	7805264	3			3	450	205	245	-190.2	-407.8	399344.8218	7804856.161	140
CAH380	15	06/29/00	8:15:00 AM	395746	7809118	1		2	3	91	55	35	74.543	52.195	395820.5428	7809170.195	40
CAH380a	15	06/29/00	8:15:00 AM	395746	7809118	1		1	2	145	276	174	-144.2	15.157	395601.7943	7809133.157	90
CAH381	15	06/29/00	8:24:00 AM	395455	7810262	5	2		7	314	74	16	301.84	86.55	395756.8362	7810348.55	320
CAH381a	15	06/29/00	8:24:00 AM	395455	7810262	3			3	33	74	16	31.722	9.096	395486.7216	7810271.096	40
CAH381b	15	06/29/00	8:24:00 AM	395455	7810262	8	1		9	800	250	200	-751.8	-273.6	394703.2459	7809988.384	790
CAH382	15	06/29/00	9:02:00 AM	393359	7811325	13	2		15	749	148	302	396.91	-635.2	393755.9095	7810689.812	570
CAH383	15	06/29/00	9:11:00 AM	392659	7810585	2			2	126	185	265	-10.98	-125.5	392648.0184	7810459.479	110
CAH384	15	06/29/00	9:18:00 AM	391706	7810146	8			8	495	164	286	136.44	-475.8	391842.4405	7809670.175	480
CAH385	15	06/29/00	9:36:00 AM	390225	7809799	34	10		44	166	130	320	127.16	-106.7	390352.1634	7809692.297	150
CAH385a	15	06/29/00	9:36:00 AM	390225	7809799	8	2		10	750	183	267	-39.25	-749	390185.748	7809050.028	500
CAH386	15	06/29/00	9:45:00 AM	388403	7810888			1	1	92	190	260	-15.98	-90.6	388387.0244	7810797.398	100
CAH387	15	06/29/00	9:57:00 AM	612104	7810831	3		10	13	226	10	80	39.244	222.57	612143.2445	7811053.567	140
CAH388	15	06/29/00	10:17:00 AM	392865	7813131	2			2	52	9	81	8.1346	51.36	392873.1346	7813182.36	50
CAH389	15	06/29/00	10:26:00 AM	391912	7813090	11	1		12	461	179	271	8.0456	-460.9	391920.0456	7812629.07	430
CAH390	15	06/29/00	11:28:00 AM	395017	7816273	1		1	2	316	258	192	-309.1	-65.7	394707.9054	7816207.3	310
CAH391	15	06/29/00	11:54:00 AM	394836	7820813			3	3	171	57	33	143.41	93.133	394979.4127	7820906.133	170
CAH392	15	06/29/00	12:30:00 PM	397914	7817926			1	1	246	136	314	170.89	-177	398084.886	7817749.042	260
CAH392a	15	06/29/00	12:30:00 PM	397914	7817926			1	1	549	94	356	547.66	-38.3	398461.6627	7817887.704	460
CAH393	15	06/29/00	12:39:00 PM	398510	7819094	3		5	8	494	338	112	-185.1	458.03	398324.9443	7819552.029	470
CAH394	15	06/29/00	12:53:00 PM	395552	7813879			1	1	80	153	297	36.319	-71.28	395588.3192	7813807.719	50
<b>Totals</b>						<b>10,368</b>	<b>1,826</b>	<b>1,133</b>	<b>13,327</b>								<b>Avg dist to rd/pad = 316</b>

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