
CHAPTER 11: CARIBOU MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014¹

LOCATION

GAME MANAGEMENT UNIT: 20A (6,796 mi²)

HERD: Delta (including former Yanert herd)

GEOGRAPHIC DESCRIPTION: Central Alaska Range and Tanana Flats

BACKGROUND

The Delta caribou herd (DCH) has historically occupied the foothills of the central Alaska Range between the Parks and Richardson Highways, north of the divide separating the Tanana and Susitna river drainages. In recent years the herd has also used the upper Nenana and Susitna river drainages, north and south of the Denali Highway. Like other small bands of Alaska Range caribou, the herd drew little attention until population identity studies began in the late 1960s. During the early to mid-1980s, the department recognized a small group of caribou in the Yanert drainage as a separate herd. The growing Delta herd eventually mixed with the Yanert herd, and after 1986, the Yanert caribou adopted the movement patterns of the larger herd (Valkenburg et al. 1988).

By the mid-1970s DCH rose from anonymity to a herd of local and scientific importance. Its proximity to Fairbanks and good access made it popular with Fairbanks hunters. For the same reasons, it has been the subject of intensive management and research. Long-term studies of caribou population dynamics, ecology, and predator-prey relationships resulted in numerous publications and reports. Boertje et al. (1996) and Valkenburg et al. (1996, 2002) provide summaries and citations.

Estimated at 1,500–2,500 in 1975, the herd had grown to a peak of nearly 11,000 by 1989. It declined sharply in the early 1990s, as did other central Alaska Range herds, to less than 4,000. Valkenburg et al. (1996) present a detailed analysis of the decline. The herd continued a slow decline and dropped to less than 3,000 animals by the early 2000s (Table 1).

Since statehood in 1959, 2 wolf control programs have been conducted in Unit 20A. During 1976–1982, state biologists killed wolves from helicopters to increase moose numbers and harvest. Boertje et al. (1996) summarized the influence of this program on moose, caribou, and wolves. From October 1993 to December 1994, state biologists and the public reduced wolf

¹ At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

numbers by trapping to halt the decline of DCH. This ground-based predation control program was terminated amid considerable controversy. Valkenburg et al. (2002) summarized the effects of this program on DCH. Research and enhancement of Delta caribou became a regional priority through the late 1990s. The department initiated an experimental diversionary feeding program in 1996 to determine whether wolves can be diverted from calving areas during the peak of calving. The project was intended to evaluate the feasibility of this technique for increasing neonate survival (Valkenburg et al. 2002).

Caribou harvest and harvest regulations have varied widely due to population fluctuations and strong hunter interest. The Alaska Board of Game (board) suspended hunting of DCH in 1992 in response to declining numbers, and the herd remained closed to hunting through regulatory year (RY) 1995 (RY = 1 July through 30 June; e.g., RY95 = 1 July 1995–30 June 1996). Hunting has been by drawing permit for bull caribou only since the hunt was resumed in RY96.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Since the mid-1970s, goals for DCH have included providing high-quality hunts, high harvests, and trophy caribou. The decline of the herd since 1989 gave impetus to the current management goals of restoring the herd and resuming a higher level of consumptive use. The current management objectives are defined in the intensive management regulation (Title 5 of the Alaska Administrative Code, regulation 92.108 [5 AAC 92.108]).

MANAGEMENT OBJECTIVES

- Maintain a fall bull:cow ratio of $\geq 30:100$ and a large bull:cow ratio of $\geq 6:100$.
- Reverse the decline of the herd and increase the midsummer population to 5,000–7,000 caribou (i.e., intensive management population objective).
- Sustain an annual harvest of 300–700 caribou (i.e., intensive management harvest objective).

METHODS

POPULATION STATUS AND TREND

Population Size

Due to unfavorable weather and because the herd did not aggregate, we were unable to complete a photocensus-based abundance estimate for DCH during 2012, 2013, and 2014.

Population Composition

We conducted composition surveys in early October using an R-44 helicopter and Bellanca Scout or Piper PA-18 fixed-wing aircraft. The biologist in the fixed-wing aircraft located the radiocollared caribou. A biologist in the R-44 helicopter classified caribou that were in groups with radiocollared animals and also classified any caribou found in a search of the surrounding area. We searched areas containing the majority of the radiocollared caribou (i.e., the Yanert and Upper Wood river drainages, the Gold King Benches, and the Little Delta River and Delta Creek drainages) and also classified caribou encountered while in transit between search areas. We

assumed bulls and cows were thoroughly mixed since surveys were conducted during the month of the rut. Classification categories consisted of cows; calves; and small (juvenile), medium (subadult), and large (mature adult) bulls. Observers identified bulls by the absence of vulva and classified bulls by antler characteristics (Eagan 1993). We either tallied the composition of each group on a 5-position counter and recorded the tallies on a data sheet or recorded composition information on a handheld digital recorder (Sony IC Recorder, model ICD-PX312, Sony Electronics, Inc., San Diego, California) and then downloaded the digital data onto a personal computer for transcription and tabulation.

Distribution and Movements

Our objective was to maintain a sample of 30–40 radiocollared female caribou to monitor distribution and movements and aid in conducting population estimation and composition surveys. Radiocollared caribou were relocated approximately once per month (excluding December and January). When we captured female calf caribou at 10 months of age in April, we weighed them for comparison with previous weights for DCH (Valkenburg et al. 2002, Valkenburg et al., *In prep*) to assess nutritional status of the herd.

MORTALITY

Harvest

We monitored harvest characteristics through drawing permit hunt reports and summarized harvest data by regulatory year.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

DCH declined from more than 10,000 in 1989 to less than 4,000 in 1993 (Table 1). The decline resulted from interrelated effects of adverse weather and predation and also occurred in neighboring herds (Valkenburg et al. 1996). However, DCH declined more than the neighboring Denali and Macomb herds. DCH existed at a much higher density than Denali and Macomb herds, indicating that density-dependent food limitation may have influenced the magnitude of the decline (Valkenburg et al. 1996). Since that decline, abundance and trajectory of the herd have been difficult to discern because estimates of herd size and recruitment have varied considerably. Survey data indicated the herd increased slightly in 1994 and 1995, but subsequent data indicated a declining trend. The minimum herd size declined from 4,646 caribou in 1995 to 2,211 caribou in 2004 (Table 1). Weather precluded completion of a census in 2005 and 2006. By 2007 the herd increased to approximately 2,985 caribou, an increase of 774 caribou ($\lambda = 1.11$) from the 2004 census. This estimate, along with much improved fall calf:cow ratios during 2004–2007, were the first indications that the herd may have been increasing. The 2008, 2009, and 2011 minimum herd counts and composition data indicated a possible decline. However, both of these estimates were fraught with difficulties (Seaton 2011).

Population Composition

During fall 2012 we classified 787 caribou: 76 small bulls, 78 medium bulls, 87 large bulls, 476 cows and 70 calves; during 2013 we classified 383 caribou: 46 small bulls, 24 medium bulls, 28

large bulls, 260 cows and 25 calves; and during 2014 we classified 622 caribou: 46 small bulls, 66 medium bulls, 45 large bulls, 399 cows and 66 calves (Table 1).

Bull:cow ratios have varied considerably since 1990, ranging 24–67:100, but have remained above 30:100 since 1998 (Table 1). The ratio of large bulls:100 cows improved once the steep population decline ended in 1993, and 2011 had the highest ratio (21:100) since 2004. These ratios imply that current harvest rates are sustainable. Most of the short-term fluctuation in bull:cow ratios is probably a result of variable behavior and distribution of bulls during counts (i.e., sampling variance rather than process variance). Weather can affect herd distribution, movements, and behavior during rut counts, and survey timing relative to rut can affect the degree of sexual segregation.

In general calf:cow ratios were relatively low and declining through the early 2000s (Table 1). Ratios in 2013 were the lowest observed since 1993. Calf mortality studies during 1995–1997 indicate these low calf:cow ratios were primarily the result of predation by wolves, grizzly bears, and golden eagles (Valkenburg et al. 2002). Analysis of fecal samples collected in late winter 1989 and 1993 indicated depletion of lichen in the foothills range in Unit 20A (Valkenburg 1997, Valkenburg et al. 2002). The proportion of lichens in the diet was relatively low, and the proportion of mosses was high compared to caribou from other Interior herds (Valkenburg et al. 2002). Moderately strong calf:cow ratios during 2004–2011 (\bar{x} = 27.6) indicate the herd was probably stable or increasing during that period. However, weak calf:cow ratios (\bar{x} = 13.9; 2012–2014) along with lower bull:cow (\bar{x} = 38; 2013–2014) and large bull:cow (\bar{x} = 11; 2013–2014) suggest that the population may have declined during 2012–2014.

Weights of 10-month-old females during 2013–2014 (\bar{x} = 53.8 kg) were similar to weights during 1995–2007 (\bar{x} = 55.7 kg; Table 2), suggesting nutritional status has not improved measurably since the population began to decline in the early 1990s (Table 1).

Distribution and Movements

Through the mid-1980s, the Delta herd showed strong fidelity to calving areas between the Delta and the Little Delta rivers in southeastern Unit 20A (Davis et al. 1991). However, as the herd increased, the area used for calving extended to the foothills between Dry Creek and the Delta River (Valkenburg et al. 1988). After 1993 the herd also used the upper Wood River, Dick Creek, upper Wells Creek, and the upper Nenana and Susitna river drainages for calving (Valkenburg et al. 2002). During the remainder of the year, the herd has typically been distributed among the northern foothills from the Delta River to the Nenana River. However, during fall and early winter 2000–2006, a significant portion of the Delta herd was located east of the Delta River near Donnelly Dome and Donnelly Flats. During 2006–2012 radiocollared caribou from the Delta herd were often found south of the Alaska Range in the Susitna river drainage as far south as Butte Lake. Typically, this occurred during the calving and postcalving periods, but some radiocollared Delta caribou could be found south of the Alaska Range all times of the year. This range extension was problematic when conducting census and composition surveys because Delta herd animals were often mixed with portions of the Nelchina herd. Management of DCH could be significantly affected if the herd continues to spend an increasing amount of time in Unit 13E south of the Yanert river drainage because harvest and herd inventory of caribou in Unit 13E is based on management objectives for the much larger

Nelchina caribou herd. We observed no major changes in distribution of the herd during 2012–2014.

MORTALITY

Harvest

Season and Bag Limit (RY12 and RY13).

	Resident open season	Nonresident open season
<i>Unit 20A</i>		
1 bull by drawing permit only; up to 200 permits may be issued.	10 Aug–20 Sep	10 Aug–20 Sep

Alaska Board of Game Actions and Emergency Orders. In response to a proposal at the March 1996 meeting and based on improved recruitment and large bull:cow ratios documented by the Alaska Department of Fish and Game (ADF&G), the board authorized a drawing permit hunt (DC827) beginning in RY96. As noted previously, harvest had been suspended in RY92. In March 2004 the board authorized an increase from 100 to 200 drawing permits that ADF&G may issue because hunter participation had been declining, and the harvest of bulls was below the recommended allowable harvest of 2–3% of the estimated population of 2,000–3,000 caribou annually. No board actions or emergency orders for the Delta herd were issued during RY12–RY13.

Permit Hunts. We issued 75 permits annually in RY96 and RY97, 100 permits annually during RY98–RY03, and 150 permits annually during RY04–RY13. Since RY09 the percentage of permittees who did not hunt (30–45%) has been relatively high but consistent (Table 3). Similarly, success rates of those who hunted have been consistently high at $\geq 44\%$ since RY04 when the department began issuing 150 permits annually. The relatively low hunter participation, especially for a drawing permit hunt, was probably a function of the majority of the herd being distributed across the eastern and central portions of its range, which is relatively inaccessible compared to the western portion, where access by all-terrain vehicles is better.

Hunter Residency and Success. Beginning in RY02, harvest by nonlocal Alaska resident and nonresident hunters (22 caribou) surpassed that of local residents (15 caribou) for the first time since the hunt began in RY96 (Young 2007). During RY03–RY07, harvest between the 2 groups equalized with an average of 20 caribou taken by nonlocal resident and nonresident hunters and an average of 20 taken by local resident hunters (Seaton 2009). Again in RY08–RY09, nonlocal residents and nonresidents harvested more caribou ($\bar{x} = 28$) than locals ($\bar{x} = 19$; Table 4; Young 2013). This trend continued through RY10 (34 vs. 18), but not RY11 (31 vs. 39) or RY12 (22 vs. 24). Again in RY13–RY14 nonlocal residents and nonresidents harvested more caribou ($\bar{x} = 37$) than locals ($\bar{x} = 18$). Success rates of nonresident hunters has typically been higher than that of resident hunters in this hunt (Young 2007; Seaton 2009, 2011). A likely explanation was that nonresidents were more inclined to participate in guided hunts, which typically have higher success rates than nonguided hunts preferred by resident hunters. However, in RY10–RY11 success rates of nonresident hunters (67%) and resident hunters (64%) were similar, and in RY14 resident success (56%) exceeded that of nonresidents (45%).

Harvest Chronology. No clear trends were apparent in harvest chronology during RY12–RY14 (Table 5). Variations in harvest chronology within and among years were likely influenced by seasonal and annual variations in weather and caribou distribution.

Transport Methods. Successful hunters (RY09–RY14) primarily used 3- or 4-wheelers (\bar{x} = 48%) and aircraft (\bar{x} = 32%) to harvest caribou (Table 6). The remaining hunters (\bar{x} = 20%) used other modes of transportation, including horses, boats, other off-road vehicles, and highway vehicles.

Other Mortality

ADF&G research staff conducted calf mortality studies during 1995–1997 and found that wolves, grizzly bears, and eagles were primary predators of caribou in Unit 20A. Details of causes and trends in calf and adult mortality are in ADF&G research reports and publications (Davis et al. 1991, Boertje et al. 1996, Valkenburg et al. 1996, Valkenburg 1997, Valkenburg et al. 1999, Valkenburg et al. 2002). Calf and adult survival were poor during the population decline; consequently, in the early 1990s the board adopted a wolf predation control implementation plan in Unit 20A to reduce wolf numbers to rebuild the caribou population. The wolf predation control plan was no longer utilized after 1994. In addition, Valkenburg (1997) and Valkenburg et al. (2002) tested a diversionary feeding program that addressed predation by a wolf pack in the Wells Creek area. They concluded diversionary feeding of wolves near caribou calving areas could successfully reduce predation in some circumstances, but it has significant limitations, primarily because wolves continue to hunt even when they are not hungry.

HABITAT

Assessment and Enhancement

In the past, research and management staff have collected fecal samples on the winter range to monitor the status and use of lichen. Analysis of fecal samples collected in late winter 1989 and 1993 indicated depletion of lichens on winter ranges used by caribou in Unit 20A. The proportion of lichens in the diet was relatively low, and the proportion of mosses was high compared to caribou in other Interior herds (Valkenburg et al. 2002), implying poor winter nutrition (Ihl 2010). We also weighed female calves to determine body condition and relate body condition to natality rates. Two studies, Valkenburg (1997) and Valkenburg et al. (2002), detailed trends of caribou calf weights. They found the heaviest mean April calf weights occurred during 1979–1983 as the Delta herd was recovering from its population low in the early 1970s. Mean calf weights declined dramatically from 1989 to 1991 coincident with deep snow winters and dry summers. Calf weights remained relatively low between 1992 and 2001 and have not recovered to the high levels seen during the late 1970s and early 1980s. Neonatal and fall calf weight and fecal data have not been collected in recent years, but the improved calf:cow ratios may be a sign that habitat quality is improving after a long period when the caribou population was at low density.

CONCLUSIONS AND RECOMMENDATIONS

We did not meet intensive management objectives to reverse the decline of the herd, increase the midsummer population to 5,000–7,000, or to sustain an annual harvest of 300–700 caribou. Research on the Delta herd, including analysis of fecal samples and condition of caribou, would

help to determine whether the current population objective is too high. However, even with favorable weather, meeting the management objectives will be unlikely without more effective predation management. Now that the Unit 20A moose population has been reduced (ADF&G unpublished data, Fairbanks), predation control to increase the size of DCH is a more viable option if the range can support higher caribou densities.

We met the objective to maintain 30 bulls:100 cows and 6 large bulls:100 cows. In March 2004 the board authorized an increase to 200 drawing permits for hunt DC827 because harvest of bulls had been below the recommended allowable harvest of 2–3% annually. Harvest rates averaged 2.6% during RY12–RY14, based on the average harvest of 52 bulls and an estimate of about 2,000 caribou in Unit 20A. At this rate, the proportion of large bulls in the population has remained high, which allowed us to meet our trophy management goal. We will continue to monitor sex ratios during fall surveys to ensure that management objectives concerning bull:cow ratios continue to be met. During the next reporting period, I recommend employing cluster sampling techniques (Cochran 1977) to estimate variance associated with ratios to improve interpretation of composition survey results.

The mixing of Delta and Nelchina herd caribou poses a significant management challenge. At this juncture, we have not been able to identify any specific pattern to their movements or mixing. As a result, we have begun to use hunt boundaries, rather than calving distribution, to define herd membership. We chose to draw the line at the subunit boundary so that the population estimate area matches the areas designated during the hunting seasons. Due to this mixing, I recommend employing a Rivest et al. (1998) technique to estimate population size and trend during the next reporting period.

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PREPARED BY:

Donald D. Young, Jr.
Wildlife Biologist III

APPROVED BY:

Jackie J. Kephart
Assistant Management Coordinator

REVIEWED BY:

Torsten W. Bentzen
Wildlife Biologist III

Laura A. McCarthy
Publications Technician II

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Table 1. Delta caribou fall composition counts and estimated population size, 1989–2014.

Composition survey date	Bulls: 100 Cows	Large bulls: 100 Cows	Calves: 100 Cows	Calves %	Cows %	Small bulls %	Medium bulls %	Large bulls %	% Total bulls	Composition sample size	Minimum herd size ^a	% Herd sampled
10/10/89	27	2	36	22	62	64	28	7	16	1,965	10,690	18
10/4/90	38	6	17	11	65	45	39	16	24	2,411	7,886 ^b	31
10/1/91	29	5	8	6	73	55	29	16	21	1,705	5,755	30
9/28/92	25	3	11	8	74	46	43	11	19	1,240	5,870	21
9/25/93 ^c	36	7	5	3	72	45	33	22	25	1,525	3,661	42
10/3–6/94 ^c	25	10	23	16	68	33	29	39	17	2,131	4,341	49
10/3/95	24	10	20	14	69	41	19	40	17	1,567	4,646	34
10/3/96	30	9	21	14	66	51	20	29	20	1,537	4,100	37
9/27/97	27	9	18	12	69	48	20	32	19	1,598	3,699	43
10/1/98	44	9	16	10	62	31	49	20	27	1,519	3,829	40
10/2/99	44	10	19	11	62	37	40	23	27	674	3,625	19
10/3–4/00	46	10	11	7	64	41	37	22	30	1,010	3,227	31
9/30/01	39	9	13	8	66	46	30	24	26	1,378	2,965	46
9/28/02	50	17	25	14	57	43	23	34	29	924	2,803	33
10/6–7/03	37	10	20	13	64	32	39	29	23	1,023	2,581	40
9/29/04	49	14	35	19	54	29	42	29	27	1,267	2,211	58
9/26/05	50	11	33	18	55	28	49	23	27	1,182	— ^d	62
10/5&15/06	40	8	27	16	60	45	36	19	24	1,022	— ^d	64
10/8/07	35	11	24	15	63	21	48	30	22	719	2,985 ^e	24
2008	— ^d	— ^d	— ^d	— ^d	— ^d	— ^d	— ^d	— ^d	— ^d	— ^d	2,078 ^e	— ^d
10/12/09	52	13	16	10	60	41	34	25	31	642	1,764 ^e	36
10/3/2010	61	16	28	15	53	43	31	26	33	1,244	— ^d	— ^d
10/3/2011	67	21	30	15	51	36	34	31	34	926	2,067 ^e	31
10/3/2012	51	18	15	9	60	32	32	36	31	787	— ^d	— ^d
10/10/2013	38	11	10	7	68	47	24	29	26	383	— ^d	— ^d
10/19/2014	39	11	17	11	64	29	42	29	25	622	— ^d	— ^d

^a Numbers of caribou counted during summer survey from the same calendar year.

^b Excludes Yanert herd, which included approximately 600 caribou.

^c Composition data was weighted according to the distribution of radio collars (Eagan 1995).

^d Survey was not conducted due to poor survey and/or weather conditions.

^e Includes only caribou within Unit 20A.

Table 2. Mean weight of samples of 10-month-old female calves from the Delta caribou herd, 1979–2015.

Year ^{a,b}	10-month-olds			
	\bar{x} (lb)	\bar{x} (kg)	$s_{\bar{x}}$ (lb)	n
1979	132.3	60.1	2.4	11
1981	137.0	62.1	7.4	5
1982	135.1	61.3	3.9	11
1983	137.2	62.2	3.3	13
1984	126.9	57.5	1.3	14
1987	120.8	54.8	2.8	9
1988	131.3	59.6	2.9	12
1989	133.6	60.6	2.7	9
1990	119.9	54.4	3.3	9
1991	113.1	51.3	2.3	9
1992	119.1	54.0	2.6	17
1993	122.3	55.5	2.9	12
1995	123.1	55.8	2.7	15
1996	120.8	54.8	3.3	15
1997	118.3	53.7	2.5	14
1998	123.7	56.1	3.0	12
1999	116.7	52.9	2.6	13
2000	114.9	52.1	2.6	12
2001	122.2	55.4	3.1	11
2002	130.0	59.0	2.0	15
2003	117.5	53.3	3.5	15
2004	129.4	58.6	3.7	14
2005	127.2	57.7	3.7	14
2007	121.7	55.3	3.5	11
2008	132.2	60.1	2.4	11
2010	120.9	54.8	1.8	7
2011	120.0	54.4	2.5	14
2013	125.8	57.1	4.2	10
2014	112.2	50.9	6.4	9
2015	115.4	52.3	3.6	5

^a Years 1979–2001 (Valkenburg et al. 2002); Years 2002–2008 (Valkenburg et al. *In prep*).

^b Missing years because there were too few calves to obtain an adequate sample of 10-month-olds those years.

Table 3. Delta caribou harvest data by permit hunt DC827, regulatory years^a 2009–2014.

Hunt	Regulatory year	Permits issued	Did not hunt (%)	Unsuccessful hunters (%)	Successful hunters (%)	Bulls (%)	Cows (%)	Unk (%)	Harvest
DC827	2009	150	49 (33)	51 (50)	50 (50)	50 (100)	0 (0)	0 (0)	50
	2010	150	67 (45)	31 (37)	52 (63)	52 (100)	0 (0)	0 (0)	52
	2011 ^b	151	45 (30)	36 (34)	70 (66)	70 (100)	0 (0)	0 (0)	70
	2012	150	67 (45)	37 (45)	46 (55)	45 (98)	0 (0)	1 (2)	46
	2013 ^c	152	55 (36)	35 (36)	62 (64)	62 (100)	0 (0)	0 (0)	62
	2014	150	62 (41)	40 (45)	48 (55)	48 (100)	1 ^d (0)	0 (0)	48

^a Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2009 = 1 July 2009–30 June 2010).

^b Includes one SC827 permit that did not hunt.

^c Two permits reissued/transferred for active duty military personnel deployed to combat zone.

^d Illegal take not included in harvest, bulls only hunt.

Table 4. Delta caribou annual hunter residency and success, permit hunt DC827, regulatory years^a 2009–2014.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local ^b resident	Nonlocal resident	Nonresident	Total (%)	Local ^b resident	Nonlocal resident	Nonresident	Total (%)	
2009	17	25	8	50 (50)	26	24	1	51 (50)	101
2010	18	28	6	52 (63)	11	16	4	31 (37)	83
2011	39	25	6	70 (67)	16	18	1	35 (33)	105
2012	24	17	5	46 (59)	21	11	0	32 (41)	78
2013	22	28	11	61 ^c (63)	14	19	2	35 (36)	96 ^c
2014	14	30	5	49 (55)	17	17	6	40 (45)	89

^a Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2009 = 1 July 2009–30 June 2010).

^b Residents of Unit 20.

^c Does not include 1 unknown.

Table 5. Delta caribou annual harvest chronology percent by harvest periods, permit hunt DC827, regulatory years^a 2012–2014.

Regulatory year	Chronology percent by harvest periods								<i>n</i>
	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Unk	
2012	22	22	9	9	17	13	9	0	46
2013	11	18	6	13	16	27	8	0	62
2014	14	18	10	16	6	16	18	0	49

^a Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2012 = 1 July 2012–30 June 2013).

Table 6. Delta caribou harvest percent by transport method, permit hunt DC827, regulatory years^a 2009–2014.

Regulatory year	Harvest percent by transport method							<i>n</i>
	Airplane	Horse	Boat	3- or 4-Wheeler	ORV ^b	Highway vehicle	Unk	
2009	32	4	4	48	2	10	0	50
2010	31	4	0	56	4	6	0	52
2011	34	10	1	39	4	10	1	70
2012	28	4	0	57	9	2	0	46
2013	29	11	3	35	10	11	0	62
2014	37	6	0	51	0	6	0	49

^a Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2009 = 1 July 2009–30 June 2010).

^b Other off-road vehicles.