

Figure 4

Distribution of caribou calves in the Bullen Point to Staines River study area, Alaska, during calving period (<20 June) surveys conducted in 1993, 1995, and 1997 to 2000.

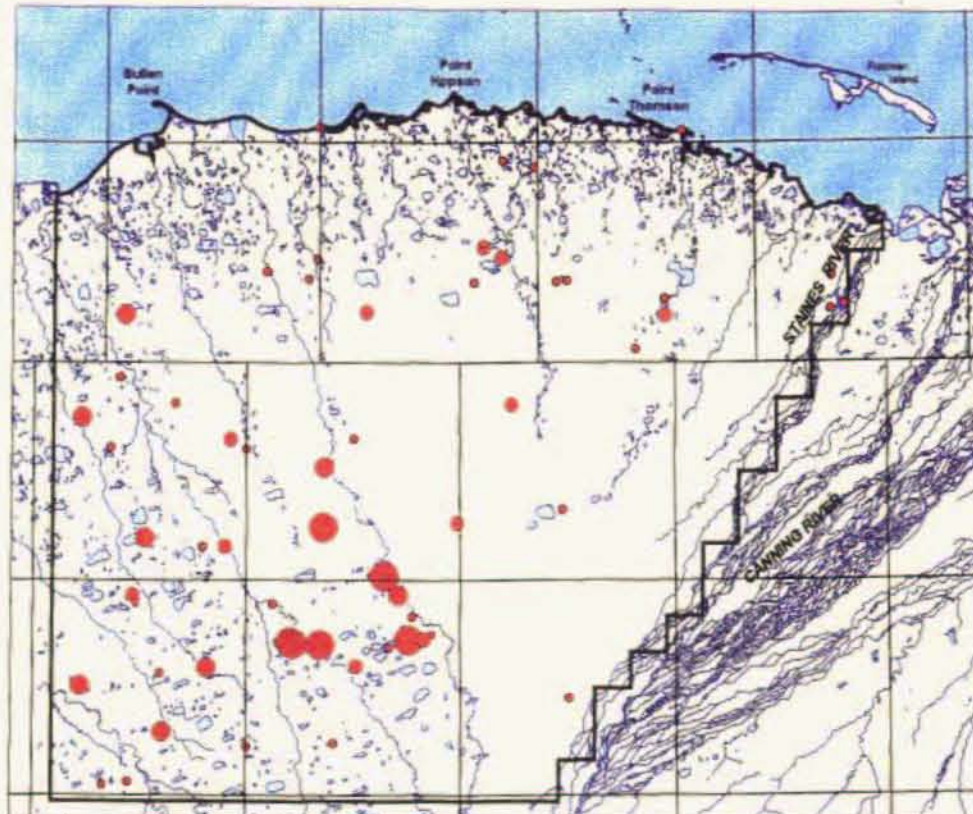
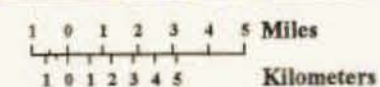
Number of Calves

- Less than 5
- 5 to 10
- 11 to 25
- Greater than 25
- Study Area Boundary

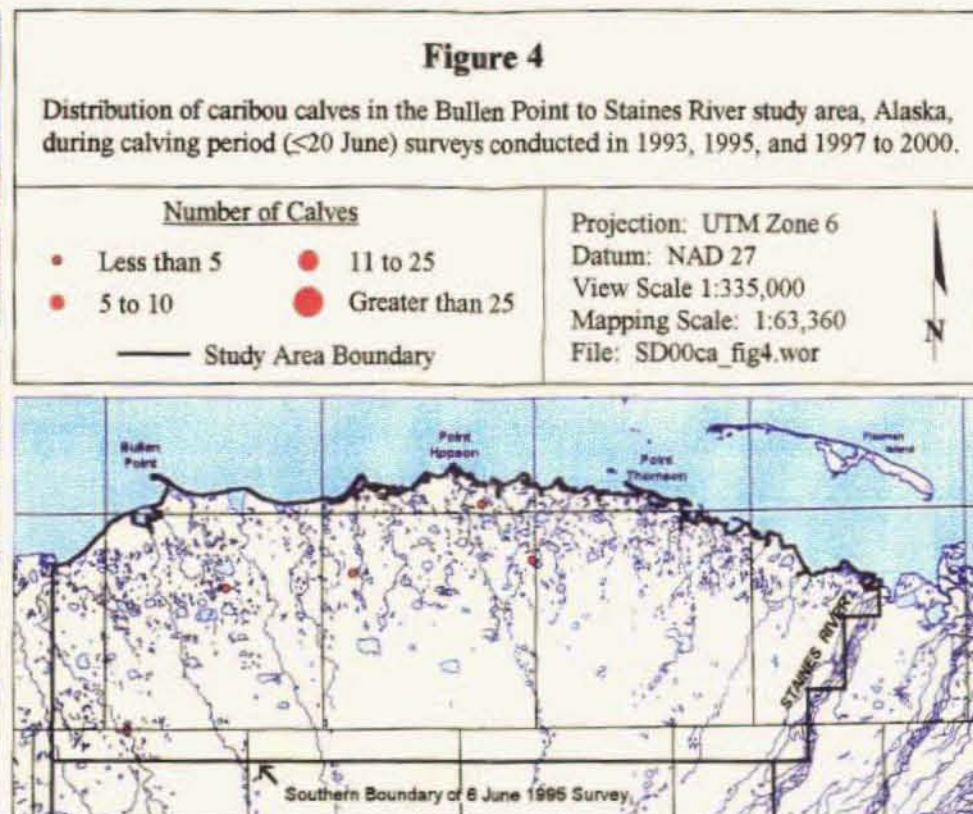
Projection: UTM Zone 6
 Datum: NAD 27
 View Scale 1:335,000
 Mapping Scale: 1:63,360
 File: SD00ca_fig4.wor



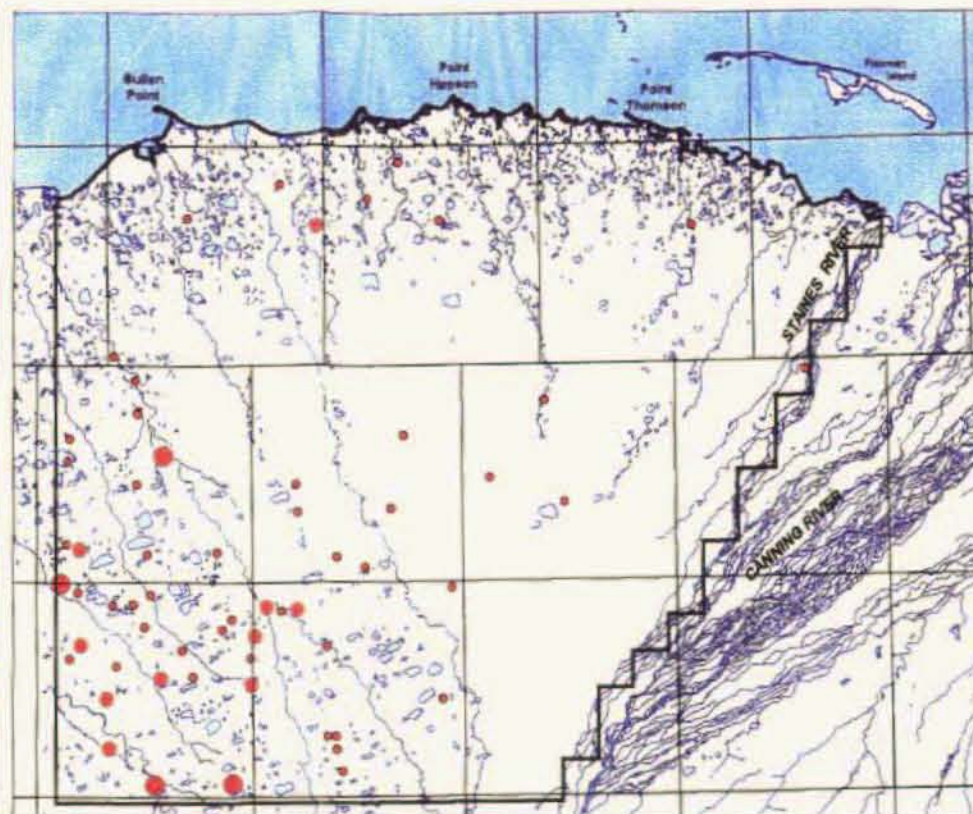
Southern Boundary of 6 June 1995 Survey



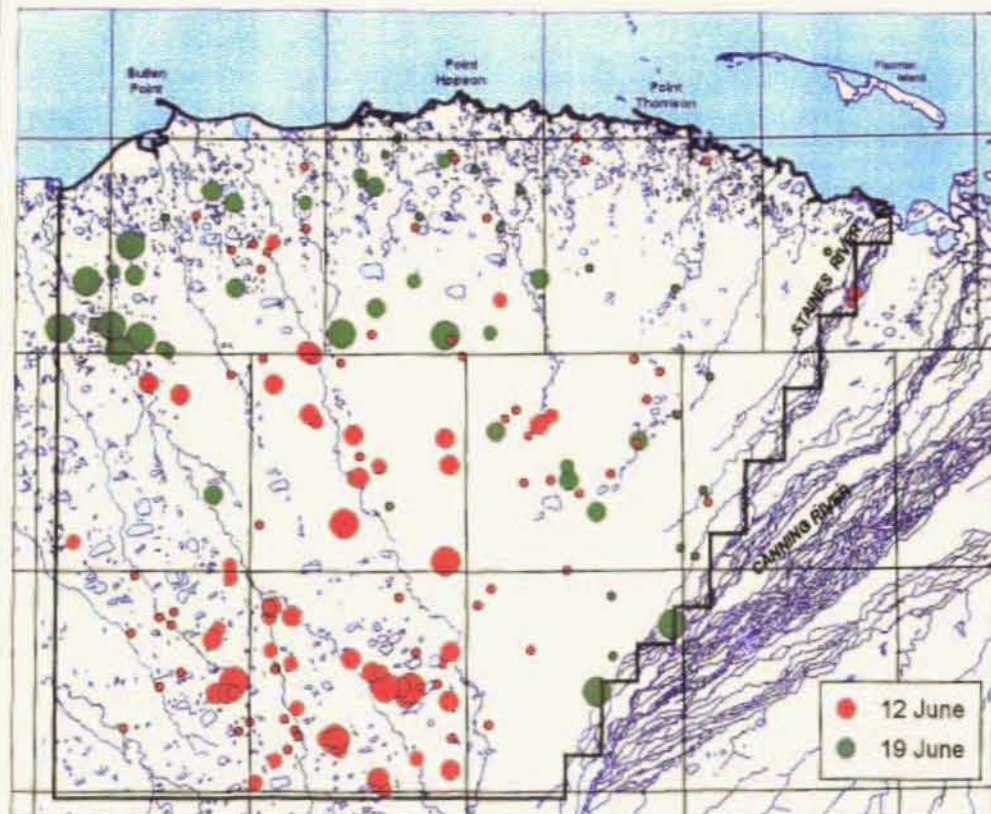
1993: 16 June Survey



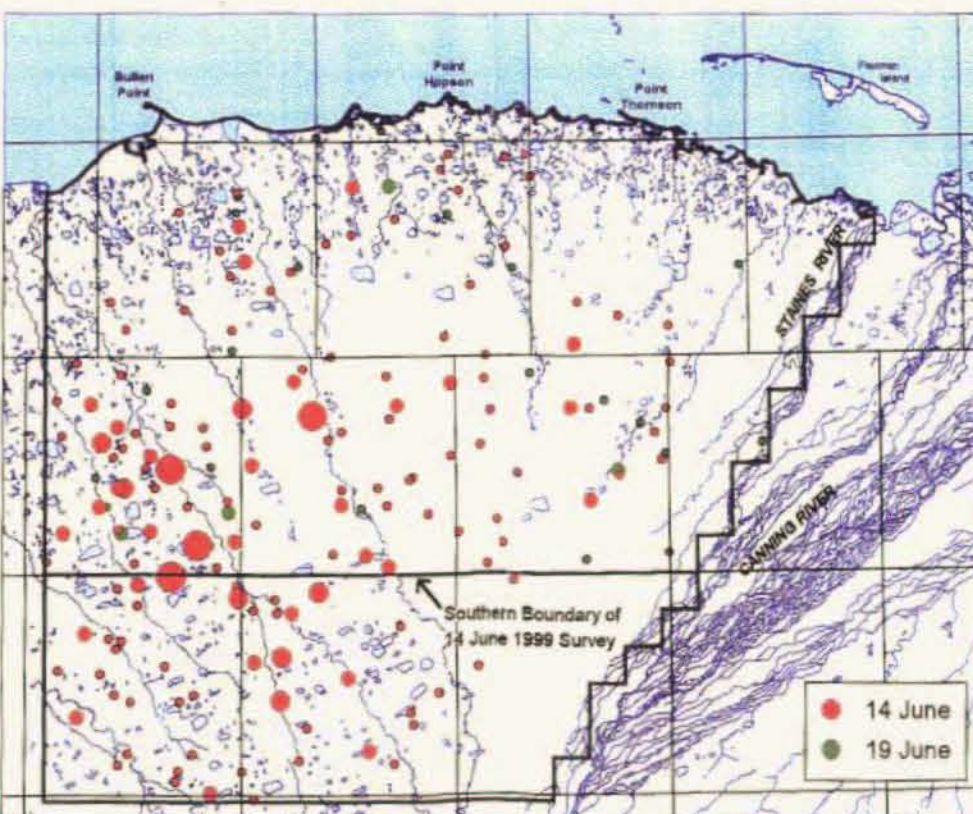
1995: 6 June Survey



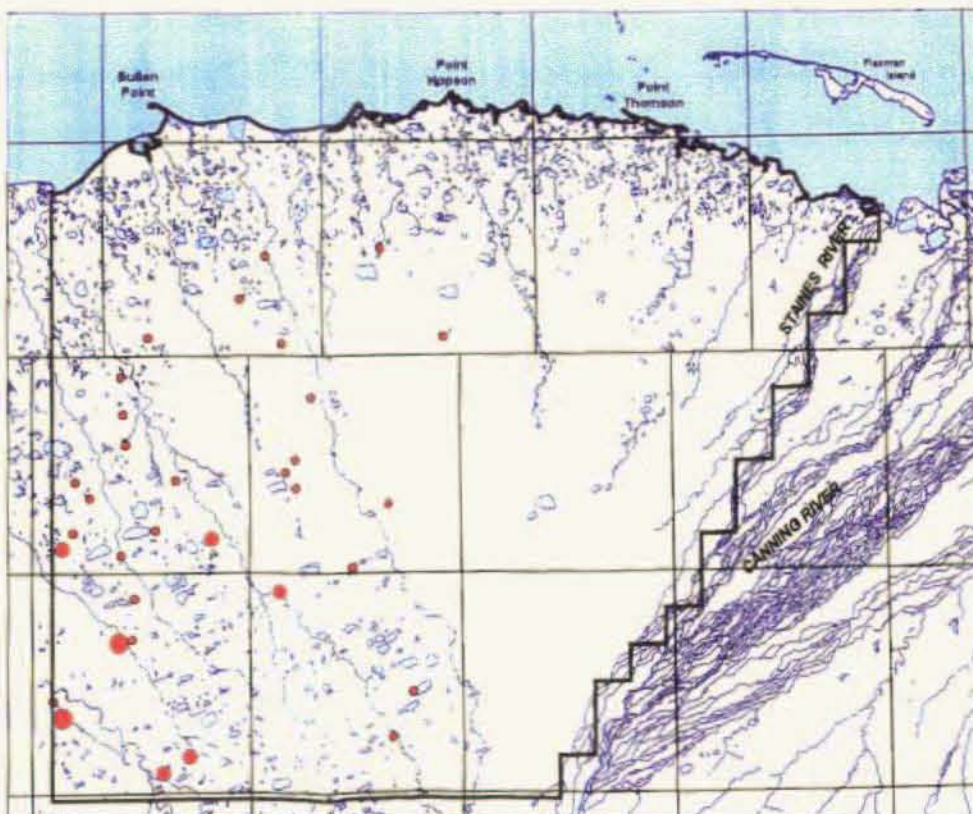
1997: 16 June Survey



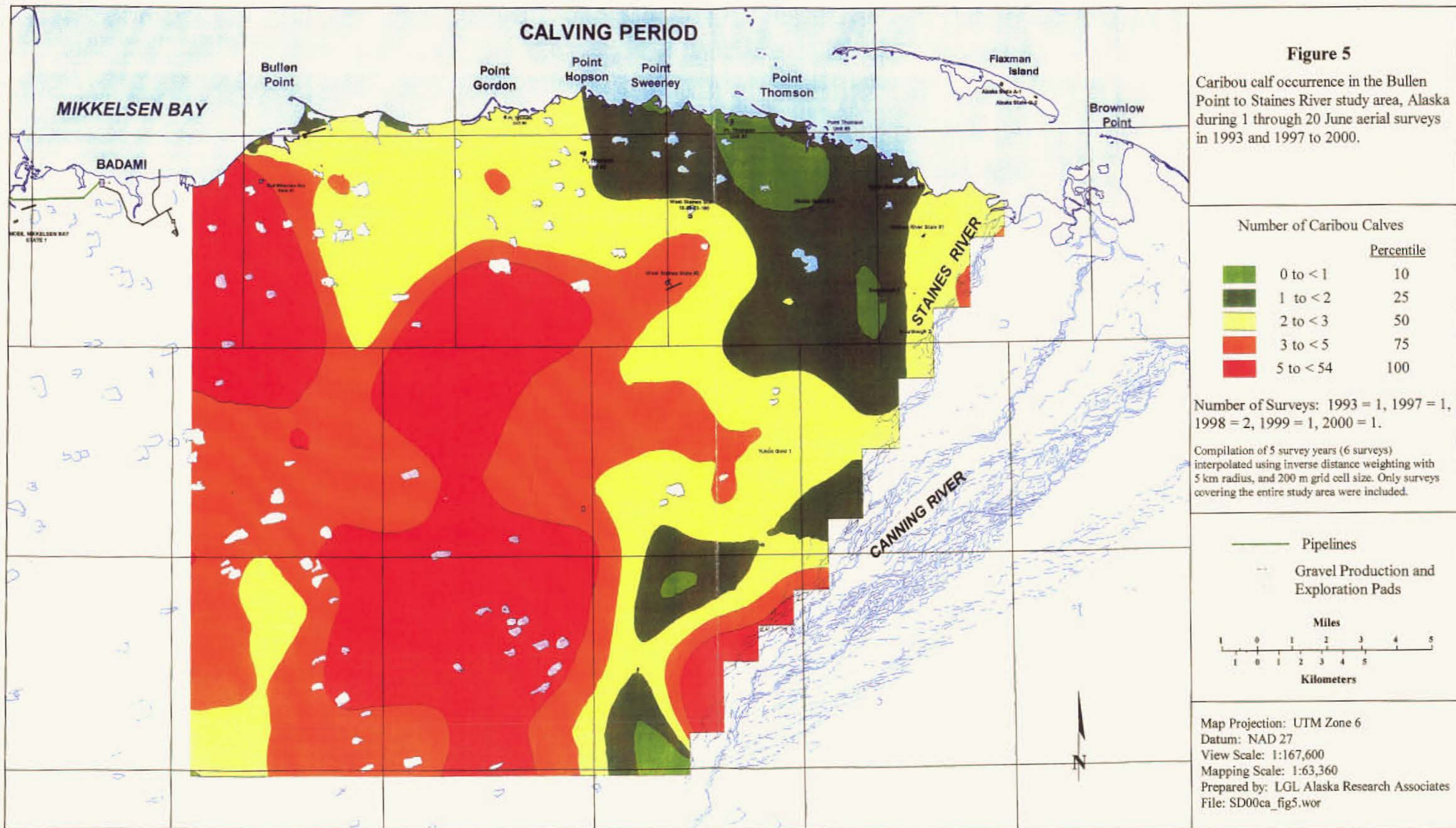
1998: 12 and 19 June Surveys



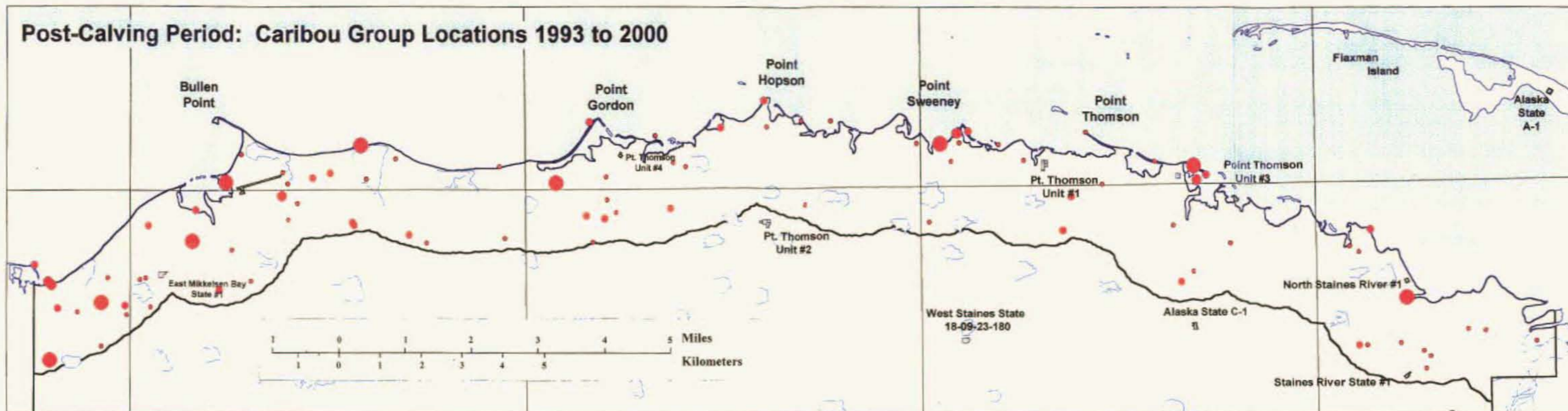
1999: 14 and 19 June Surveys



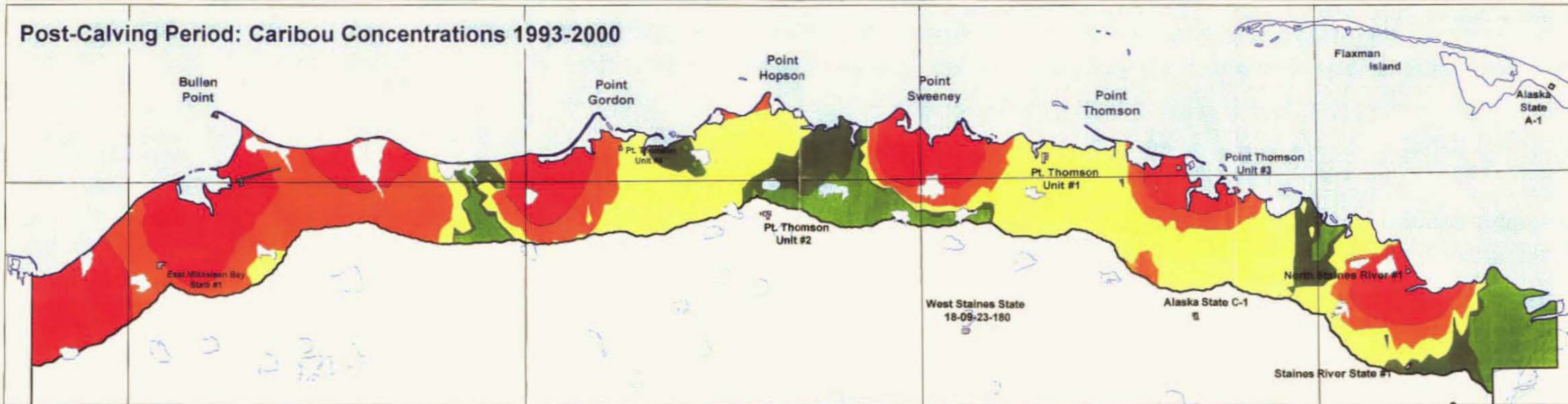
2000: 16 June Survey



Post-Calving Period: Caribou Group Locations 1993 to 2000



Post-Calving Period: Caribou Concentrations 1993-2000



Caribou Group Size

Group Size	No. Groups
Less than 10	52
10 to 100	24
101 to 250	5
Greater than 250	9

Number of Caribou

Number of Caribou	Percentile
0 to < 2	10
2 to < 3	25
3 to < 12	50
12 to < 48	75
48 to 600	100

Boundary of 2 km Coastal Buffer

Gravel Production and Exploration Pads



Map Projection: UTM Zone 6
 Datum: NAD 27
 View Scale: 1:96,630
 Mapping Scale: 1:63,360
 Prepared by: LGL Alaska Research Associates, Inc.
 File: SD00ca_fig6.wor

Figure 6

Caribou occurrence within 2 km of the coast in the Bullen Point to Staines River study area, Alaska, during 21 June through 31 July, based on aerial surveys conducted in 1993, 1995, and 1997 to 2000.

Compilation of caribou sighting data from 23 aerial surveys, interpolated using inverse distance weighting with 2 km radius, and 200 m grid cell size.

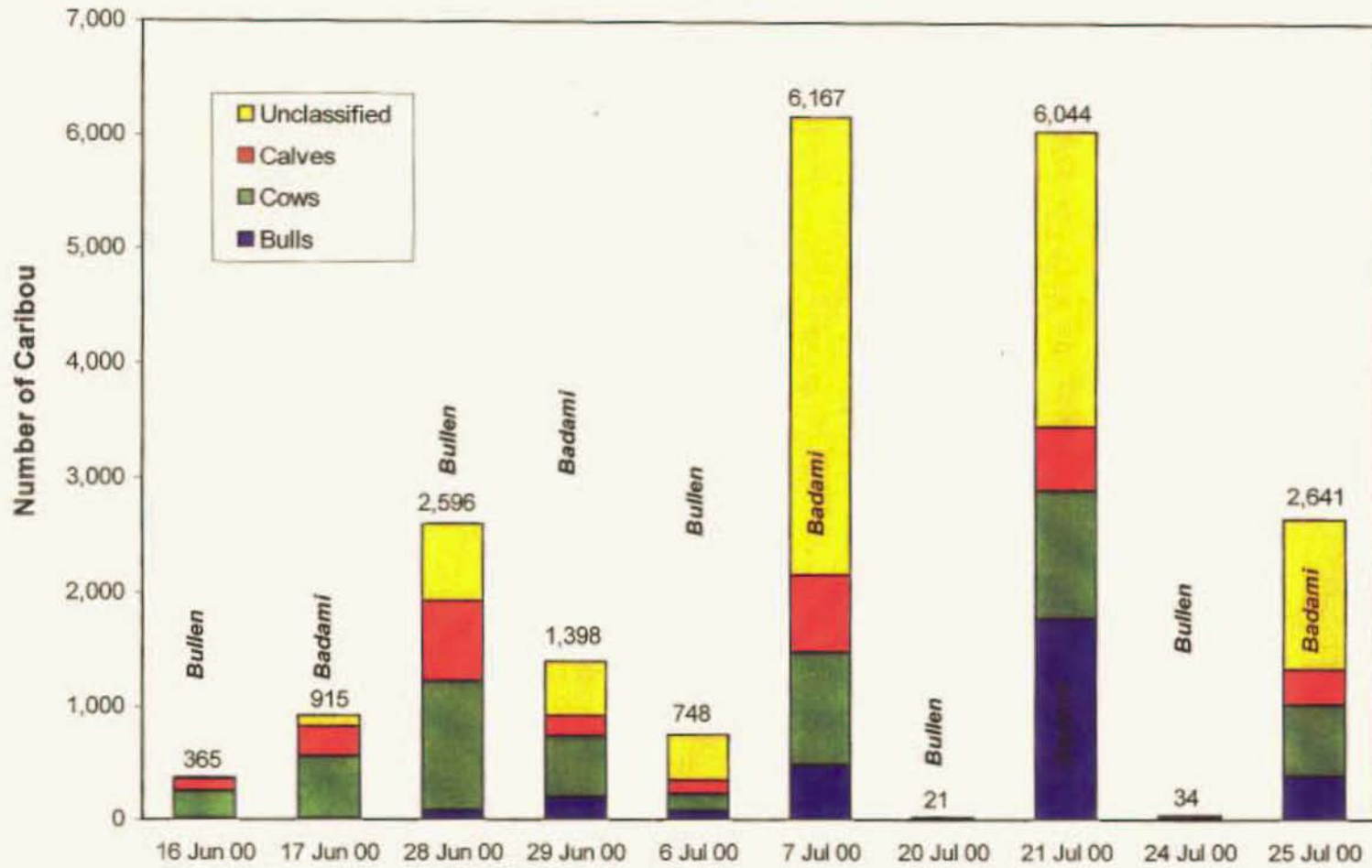


Figure 7. Comparison of the number of caribou by sex/age class during paired surveys in the Bullen Point to Staines River and the Badami study areas, Alaska, summer 2000.

Table 1. Sex and age classification of caribou and muskoxen observed during systematic aerial surveys in the Bullen Point to Staines River study area, Alaska, 16 June to 24 July 2000.

Flight	Date	Number of Caribou					Number of Groups
		Bulls	Cows	Calves	Unclass	Total	
Caribou							
1	16 Jun 00	0	241	107	17	365	66
2	28 Jun 00	76	1,145	700	675	2,596	188
3	6 Jul 00	70	152	118	408	748	22
4	20 Jul 00	2	5	5	9	21	8
5	24 Jul 00	6	4	2	22	34	12
Muskoxen							
1	16 Jun 00	0	0	0	2	2	1
2	28 Jun 00	2	2	0	15	19	3
3	6 Jul 00	0	0	0	0	0	
4	20 Jul 00	1	3	0	4	8	2
5	24 Jul 00	1	0	0	8	9	1

Table 2. Caribou densities (number/km²) by 1-km intervals from the Beaufort Sea coast in the Bullen Point to Staines River study area, Alaska, 16 June to 24 July 2000.

One-Kilometer Intervals																														Area and Caribou Totals	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
Land Area (sq km)	43.6	37.5	37.2	36.7	36.6	37.3	37.6	38.0	38.2	37.4	34.9	34.6	32.6	31.4	31.0	30.3	30.7	30.6	28.6	27.6	28.0	27.9	27.1	24.2	23.9	23.9	20.3	16.4	13.3	7.2	904.5
Calving Period																															
Survey 1--16 June 2000																															
Total	0.00	0.05	0.00	0.19	0.00	0.21	0.00	0.13	0.05	0.21	0.09	0.12	0.25	0.61	1.13	0.76	0.85	0.46	0.18	2.76	0.61	0.18	1.18	0.08	0.00	1.97	0.39	0.37	0.23	0.00	365
	(0)	(2)	(0)	(7)	(0)	(8)	(0)	(5)	(2)	(8)	(3)	(4)	(8)	(19)	(35)	(23)	(26)	(14)	(5)	(76)	(17)	(5)	(32)	(2)	(0)	(47)	(8)	(6)	(3)	(0)	
Calves	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.05	0.03	0.05	0.03	0.03	0.06	0.16	0.45	0.26	0.26	0.13	0.00	0.80	0.21	0.04	0.44	0.00	0.00	0.50	0.00	0.12	0.00	0.00	107
	(0)	(0)	(0)	(0)	(0)	(4)	(0)	(2)	(1)	(2)	(1)	(1)	(2)	(5)	(14)	(8)	(8)	(4)	(0)	(22)	(6)	(1)	(12)	(0)	(0)	(12)	(0)	(2)	(0)	(0)	
Post-Calving Period																															
Survey 2--28 June 2000																															
Total	0.07	0.03	0.05	0.27	0.33	0.54	0.32	0.42	3.59	2.70	2.29	5.26	8.45	13.00	10.49	12.90	7.03	6.24	1.26	4.21	0.79	0.54	0.00	0.66	0.00	0.17	0.00	0.00	0.15	0.28	2596
	(3)	(1)	(2)	(10)	(12)	(20)	(12)	(16)	(137)	(101)	(80)	(182)	(276)	(408)	(325)	(391)	(216)	(191)	(36)	(116)	(22)	(15)	(0)	(16)	(0)	(4)	(0)	(0)	(2)	(2)	
Calves	0.00	0.00	0.03	0.03	0.11	0.16	0.08	0.03	1.26	0.83	0.57	1.56	2.27	3.79	3.16	3.69	1.66	0.98	0.11	1.34	0.21	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	700	
	(0)	(0)	(1)	(1)	(4)	(6)	(3)	(1)	(48)	(31)	(20)	(54)	(74)	(119)	(98)	(112)	(51)	(30)	(3)	(37)	(6)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	
Survey 3--6 July 2000																															
Total	3.31	4.50	0.08	0.08	0.08	0.19	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	6.51	0.03	7.43	0.07	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	748
	(144)	(169)	(3)	(3)	(3)	(7)	(1)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(200)	(1)	(212)	(2)	(0)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
Calves	0.69	0.27	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118
	(30)	(10)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(76)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
Survey 4--20 July 2000																															
Total	0.00	0.19	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21
	(0)	(7)	(0)	(1)	(3)	(0)	(0)	(0)	(0)	(0)	(0)	(8)	(1)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
Calves	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5
	(0)	(3)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
Survey 5--24 July 2000																															
Total	0.00	0.00	0.00	0.03	0.00	0.00	0.11	0.18	0.08	0.00	0.03	0.03	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	34
	(0)	(0)	(0)	(1)	(0)	(0)	(4)	(7)	(3)	(0)	(1)	(1)	(0)	(0)	(0)	(15)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	
Calves	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2
	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	

Table 3. Caribou group sightings by activity and habitat types (Walker 1983; see Table 4) recorded during aerial strip-transect surveys conducted in the Bullen Point to Staines River study area, Alaska, 16 June to 24 July 2000.

Flight Activity	Water	Wet Sedge Tundra	Wet Sedge/Moist Sedge, Dwarf Shrub Tundra Complex	Wet Sedge/Moist Sedge/Barren Complex	Moist/Wet Sedge Complex	Moist Sedge, Dwarf Shrub Tundra	Moist Tussock Sedge, Dwarf Shrub Tundra	Dry, Dwarf Shrub, Crustose Lichen Tundra	Moist Graminoid, Dwarf Shrub Tundra/ Barren Complex	Dry Barren/Dwarf Shrub Forb Grass Complex	River Gravels	Wet Mud	No Habitat Data	Total
	Ia	IIla	IIId	IIIe	IVa	Va	Vb	Vc	Ve	IXb	Xa	Xb		
Flight 1 -- 16 June 2000														
Rest	0	0	0	0	0	3	0	3	1	0	0	0	3	10
Stand	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Feed	0	1	0	0	0	3	0	3	0	0	0	0	9	16
Walk	0	0	2	0	0	0	0	0	1	0	0	0	0	3
Trot	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Run	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Move	0	0	0	0	0	0	0	0	1	0	0	0	0	1
No Data	0	0	0	0	0	1	0	1	1	0	0	0	32	35
Total	0	1	2	0	0	7	0	8	4	0	0	0	44	66
Flight 2 -- 28 June 2000														
Rest	0	0	9	11	2	7	2	3	5	0	0	0	1	40
Stand	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Feed	0	0	9	8	0	6	2	2	1	0	0	0	0	28
Walk	0	0	2	1	0	1	2	0	0	1	0	0	0	7
Trot	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Run	0	0	1	1	0	1	0	0	0	0	0	0	0	3
Move	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Data	0	0	1	3	0	0	0	2	1	0	0	0	101	108
Total	0	0	22	24	2	16	6	8	7	0	1	0	102	188
Flight 3 -- 6 July 2000														
Rest	0	0	0	1	0	0	0	0	0	1	0	0	0	2
Stand	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Feed	0	0	2	2	0	3	0	0	1	0	0	0	1	9
Walk	0	0	0	0	0	1	1	0	0	0	0	0	0	2
Trot	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Run	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Move	1	0	1	0	0	0	0	0	0	0	0	1	1	4
Swim	0	0	0	0	0	0	0	0	0	0	0	0	1	1
No Data	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	1	2	3	3	0	4	1	1	1	2	0	1	3	22
Flight 4 -- 20 July 2000														
Rest	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Stand	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feed	0	1	1	0	0	1	1	0	0	0	0	0	0	4
Walk	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Trot	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Run	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Move	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Data	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	1	1	1	0	1	1	1	0	0	0	0	2	8
Flight 5 -- 24 July 2000														
Rest	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Stand	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Feed	0	1	0	0	0	1	0	1	1	0	0	0	0	4
Walk	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Trot	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Run	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Move	0	0	0	0	0	0	0	1	0	0	0	0	0	1
No Data	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Total	0	1	0	0	0	1	0	4	3	0	0	0	3	12

Table 4. Hierarchical vegetation categories based on Walker's (1983) vegetation classification.

LEVEL A SMALL- SCALE UNITS	LEVEL B LANDSAT- SCALE UNITS	LEVEL C PHOTO-INTERPRETED MAP UNITS	LEVEL D TYPICAL PLANT COMMUNITIES
A. Water	I. Water	Ia. Water (ponds, lakes, rivers, streams, saltwater)	No vegetation
B. Wet Tundra	II. Very Wet Tundra	IIb. Aquatic Graminoid Tundra (emergent vegetation)	Aquatic <i>Arctophila fulva</i> Grass Tundra Aquatic <i>Carex aquatilis</i> Sedge Tundra
		IIc. Water/Tundra Complex (pond complex with emergent vegetation)	Typical communities listed in IIb, IIIa, and Va
	III. Wet Tundra	IIIa. Wet Sedge Tundra	Wet <i>Carex aquatilis</i> , <i>Scorpidium scorpioides</i> Sedge Tundra (wettest facies of wet alkaline tundra) Wet <i>Carex aquatilis</i> , <i>Eriophorum angustifolium</i> , <i>Pedicularis sudetica</i> , <i>Drepanocladus brevifolius</i> Sedge Tundra (wet alkaline tundra) Wet <i>Eriophorum angustifolium</i> , <i>Dupontia fisheri</i> , <i>Campylium stellatum</i> Graminoid Tundra (wet acidic tundra, coastal areas)
		IIIb. Wet Graminoid Tundra (wet saline tundra, saltmarsh)	Wet <i>Carex subspathacea</i> , <i>Puccinellia phryganodes</i> , <i>Stellaria humifusa</i> , <i>Cochlearia officinalis</i> Sedge Tundra
		IIIc. Wet Sedge Tundra/Water Complex (pond complex, no emergent vegetation)	Typical communities listed in IIIa and Va
		IIId. Wet Sedge/Moist Sedge, Dwarf Shrub Tundra Complex (wet patterned-ground complex)	Typical communities listed in IIIa and Va, and sometimes IIb
		IIIe. Wet Sedge/Moist Sedge/Barren Complex (wet frost-scar tundra complex)	Typical communities listed in IIIa, Va and Ve
C. Moist Tundra	IV. Moist/Wet Tundra Complex	IVa. Moist Sedge, Dwarf Shrub/Wet Graminoid Tundra Complex (moist patterned ground complex)	Typical communities listed in IIIa and Va
	V. Moist or Dry Tundra	Va. Moist Sedge, Dwarf Shrub Tundra	Moist <i>Carex bigelowii</i> , <i>Eriophorum angustifolium</i> , <i>Dryas integrifolia</i> , <i>Salix reticulata</i> , <i>Tomenthypnum nitens</i> , <i>Thamnolia subuliformis</i> Sedge, Dwarf Shrub Tundra (moist alkaline tundra) Moist <i>Luzula arctica</i> , <i>Poa arctica</i> , <i>Saxifraga cernua</i> , <i>Salix planifolia</i> , <i>Dicranum elongatum</i> , <i>Ochrolechia frigida</i> Graminoid, Dwarf Shrub, Crustose Lichen Tundra (moist acidic tundra)

Table 4. Continued

LEVEL A SMALL- SCALE UNITS	LEVEL B LANDSAT- SCALE UNITS	LEVEL C PHOTO-INTERPRETED MAP UNITS	LEVEL D TYPICAL PLANT COMMUNITIES
C. Moist Tundra (continued)	V. Moist or Dry Tundra (continued)	Va. Moist Sedge, Dwarf Shrub Tundra (continued)	Moist <i>Carex aquatilis</i> , <i>Eriophorum angustifolium</i> , <i>Salix planifolia</i> , <i>Campylium stellatum</i> Sedge, Dwarf Shrub Tundra (moist acidic tundra, wetter facies)
		Vb. Moist Tussock Sedge, Dwarf Shrub Tundra	Moist <i>Eriophorum vaginatum</i> , <i>Dryas integrifolia</i> , <i>Salix reticulata</i> , <i>S. arctica</i> , <i>Tomenthypnum nitens</i> , <i>Thamnolia subuliformis</i> , Tussock Sedge, Dwarf Shrub Tundra (alkaline tussock tundra) Moist <i>Eriophorum vaginatum</i> , <i>Dryas integrifolia</i> , <i>Salix planifolia</i> ssp. <i>pulchra</i> , <i>Salix reticulata</i> , <i>Hylocomium splendens</i> , <i>Ptilidium ciliare</i> , <i>Cetraria cucullata</i> Tussock Sedge, Dwarf Shrub Tundra (neutral to slightly acidic tussock tundra)
		Vc. Dry, Dwarf Shrub, Crustose Lichen Tundra (<i>Dryas</i> tundra, pingos, river bars)	Dry <i>Dryas integrifolia</i> , <i>Carex rupestris</i> , <i>Oxytropis nigrescens</i> , <i>Salix reticulata</i> , <i>Ditrichum flexicaule</i> , <i>Lecanora epibyron</i> Dwarf Shrub, Forb, Crustose Lichen Tundra (<i>Dryas</i> tundra, pingos) Dry <i>Dryas integrifolia</i> , <i>Astragalus alpinus</i> , <i>Oxytropis borealis</i> , <i>Salix reticulata</i> , <i>Distichium capillaceum</i> , <i>Lecanora epibyron</i> Dwarf Shrub, Forb, Crustose Lichen Tundra (<i>Dryas</i> tundra, river bars)
		Vd. Dry, Dwarf Shrub, Fruticose Lichen Tundra (dry acidic tundra)	Dry <i>Salix rotundifolia</i> , <i>Pedicularis kanei</i> , <i>Luzula arctica</i> , <i>Polytrichum</i> sp., <i>Alectoria nigricans</i> , <i>Cetraria islandica</i> Dwarf Shrub, Fruticose Lichen Tundra (dry acidic tundra near coast)
		Ve. Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar tundra complex)	Typical communities listed in Va plus either completely barren frost scars or communities such as: Dry <i>Saxifraga oppositifolia</i> , <i>Dryas integrifolia</i> , <i>Chrysanthemum integrifolium</i> , <i>Juncus biglumis</i> , <i>Arctagrostis latifolia</i> , <i>Ochrolechia frigida</i> Barren (alkaline frost scars)
E. Partially Vegetated and Barren	IX. Partially Vegetated	IXb. Dry Barren/Dwarf Shrub, Forb Grass Complex (forb rich river bars)	Typical communities listed in Vc, and mixed forb, grass and dwarf shrub communities such as: Dry <i>Bromus pumellianus</i> , <i>Festuca rubra</i> , <i>Astragalus alpinus</i> , <i>Androsace chamaejasme</i> , <i>Salix ovalifolia</i> Grass, Forb, Dwarf Shrub Tundra (forb rich river bars) Dry <i>Dryas integrifolia</i> , <i>Artemisia borealis</i> , <i>A. glomerata</i> , <i>Salix ovalifolia</i> , <i>Androsace chamaejasme</i> Dwarf Shrub, Forb Tundra (<i>Dryas</i> river bars near arctic coast)

Table 4. Continued

LEVEL A SMALL- SCALE UNITS	LEVEL B LANDSAT- SCALE UNITS	LEVEL C PHOTO-INTERPRETED MAP UNITS	LEVEL D TYPICAL PLANT COMMUNITIES
E. Partially Vegetated and Barren (continued)	IX. Partially Vegetated (continued)	IXe. Dry Barren/Grass Complex (coastal sand dune grassland)	Dry <i>Elymus arenarius</i> Grass Tundra (coastal sand dune grassland)
		IXf. Dry Barren/Dwarf Shrub Grass complex (sand dune steppe)	Dry <i>Artemisia borealis</i> , <i>A. glomerata</i> , <i>Deschampsia caespitosa</i> , <i>Trisetum spicatum</i> Dwarf Shrub, Grass Tundra (sand dune steppe)
		IXg. Dry Barren/Low Shrub, Grass Complex (sand dune scrub)	Dry <i>Salix alaskensis</i> , <i>S. glauca</i> , <i>Elymus arenarius</i> , <i>Carex obtusata</i> , <i>Dryas integrifolia</i> Low Shrub, Tundra (sand dune scrub)
		IXh. Wet Barren/Wet Sedge Tundra Complex (barren/saline tundra complex, saltmarsh)	Typical communities listed in IIIb
		IXi. Dry Barren/Forb, Graminoid Complex (coastal barrens)	Dry <i>Cochlearia officinalis</i> , <i>Stellaria humifusa</i> , <i>Puccinellia phryganodes</i> , <i>P. andersonii</i> , <i>Salix ovalifolia</i> , <i>Potentilla pulchella</i> Forb, Graminoid Tundra (coastal saline barrens)
X. Light- colored Barrens (ground cover <30%)		Xa. River Gravels	Completely barren or with communities listed under IXb and IXc..
		Xb. Sand Dunes	Typical communities listed under IXe, IXf, IXg
		Xc. Barren Gravel Outcrops	Typical communities listed under Vd or IXe or the following among many others; <i>Dry Dryas octopetala</i> , <i>Lupinus arcticus</i> , <i>Potentilla biflora</i> , <i>Smelowski calycina</i> , <i>Saxifraga tricusoidata</i> , <i>Salix phlebophylla</i> , <i>Silene acaulis</i> Dwarf Shrub Barren (gravel outcrops)
		Xe. Gravel Roads and Pads	Completely barren or partially vegetated with communities similar to IXb and IXc
XI. Dark-colored Barrens (ground cover <30%)		XIa. Wet Mud (drained lakes and ponds)	Completely barren or occasionally with colonizing species such as <i>Deschampsia caespitosa</i> and <i>Senecio congestus</i>
		XIc. Bare Peat (mostly barren coastal areas caused by storm surges)	Completely barren or with sparse communities similar to IIIa, Va, and IXi