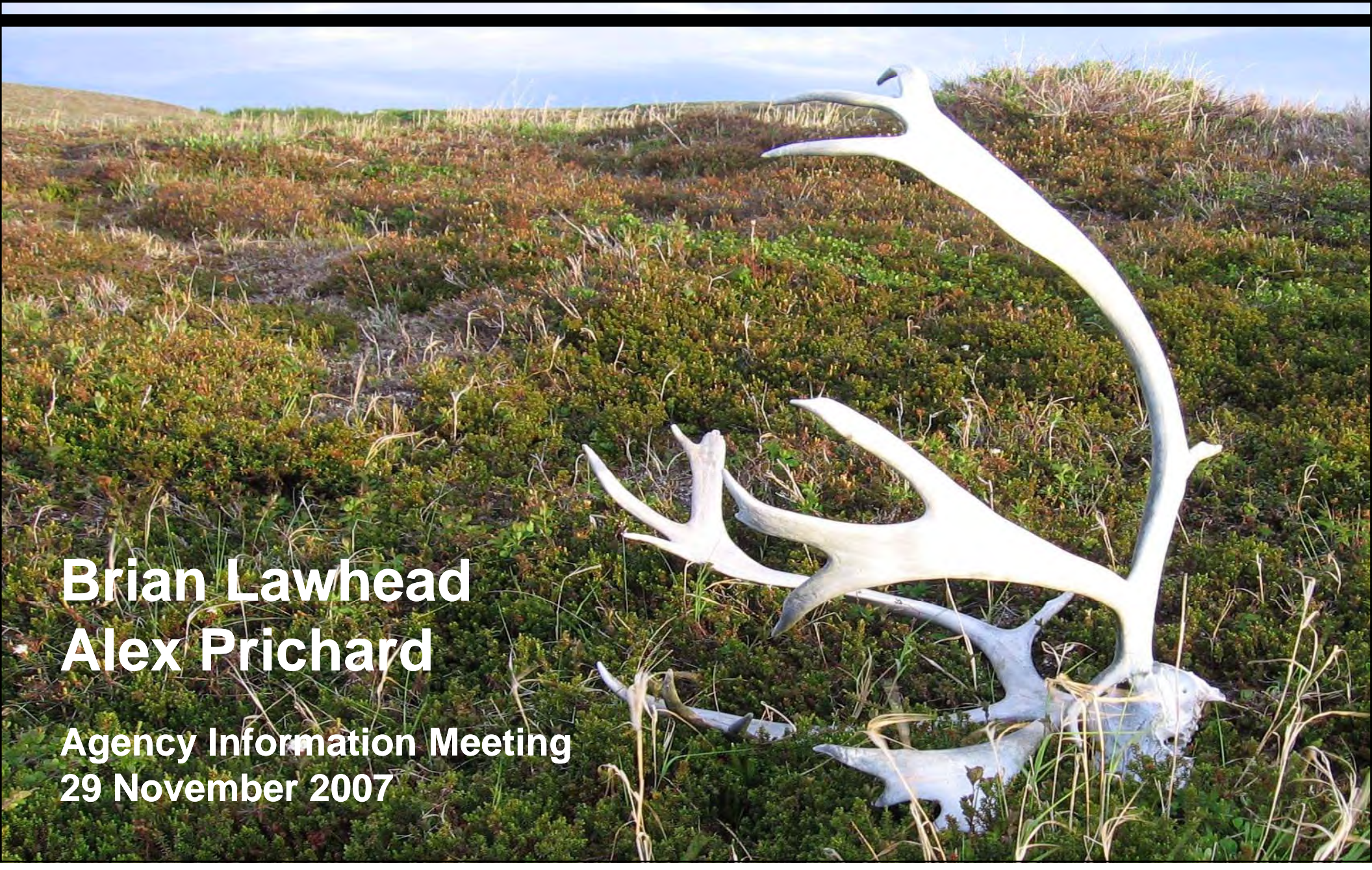


Mammal Surveys

Brian Lawhead
Alex Prichard

Agency Information Meeting
29 November 2007



Objectives: Mammals

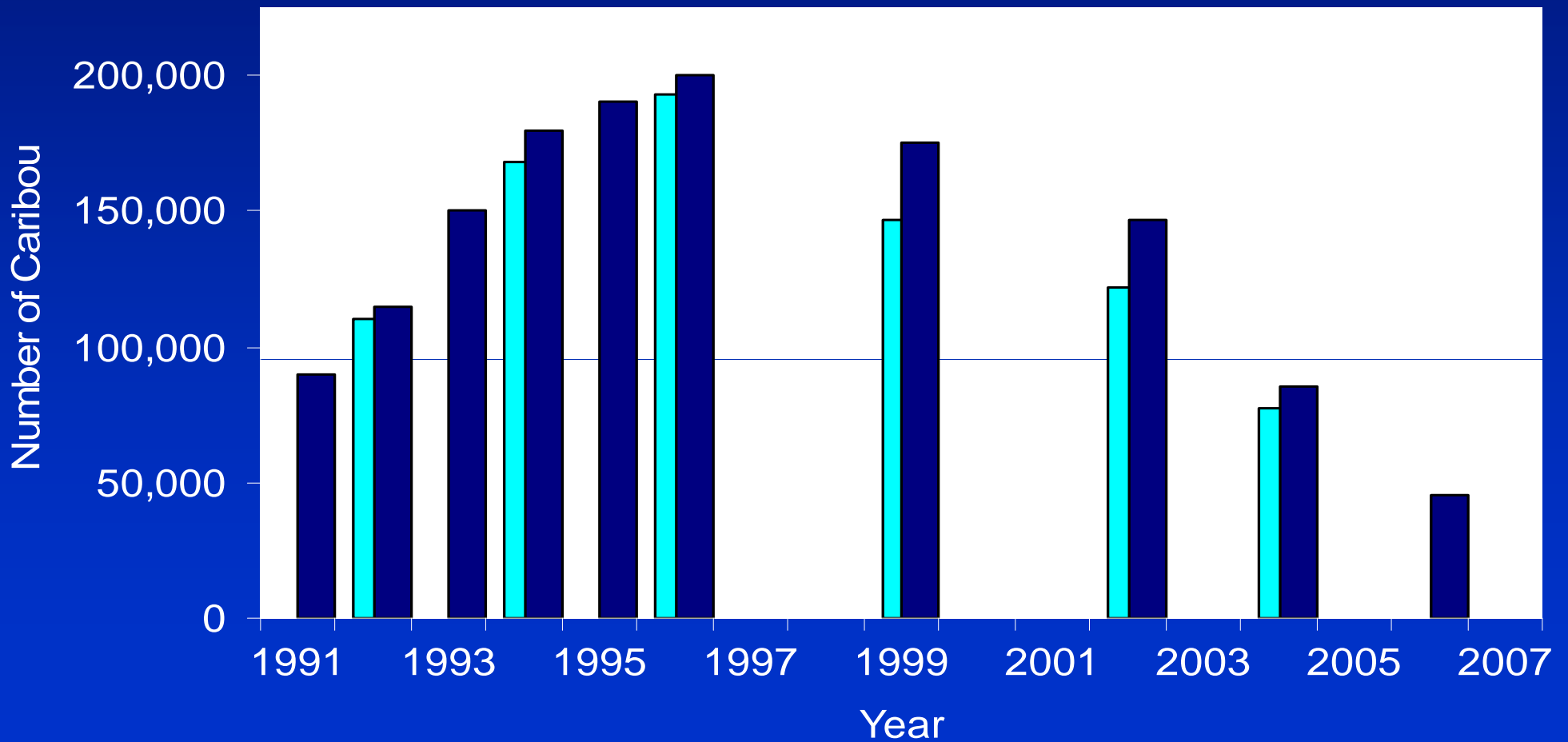
- Assess seasonal distribution & abundance of selected species through field surveys in mine area & transportation corridor, to provide background for NEPA analysis
- Review existing information from agencies & literature on these & other mammal species in project area
- Analyze existing population-survey & telemetry data
- Engage local participants in surveys
- Collect incidental observations from other project personnel & contractors
- Develop cooperative study efforts with agencies for bear telemetry study & baseline trace-element tissue-sampling in selected species, through Technical Working Group

Caribou

- Mulchatna Herd peaked at ~200,000 in 1996, then subsequently declined to ~45,000 by 2006
- >25-year telemetry data set managed by MCHTWG
- Notable for widely variable, unpredictable range use over large areas of southwest Alaska in the past 15 years
- Past use of mine area (including early 1990s telemetry):
 - Wintering
 - Calving
 - Postcalving aggregation
- Most recent use mainly postcalving (late June–early July)
- Little use of range in transportation corridor east of Newhalen River

Mulchatna Caribou Herd estimates by ADFG

dark blue = estimates
light blue = aerial photocensus counts



Brown Bear

- Gradient from moderate-density inland population (39/1,000 km²) to high-density coastal population (150/1,000 km²); reportedly stable or increasing slowly
- Notable seasonal concentrations in coastal bays and at salmon spawning streams
- Important for both hunting & viewing opportunities (GMU 9A/B state hunting season open only in odd-year falls & even-year springs)
- Potential for attraction to areas of human activity = concern for safety of humans & bears
- Low reproductive rate = concern over effects of human-caused mortality & disturbance

Harbor Seal

- Subject to permitting concerns under Marine Mammal Protection Act
- Susceptible to disturbance when hauled out, especially during pupping in early summer & molt in late summer
- Coastal bays near potential port site known to host large numbers of seals (see Marine Wildlife section)
- Iliamna Lake hosts only freshwater seal population in Alaska



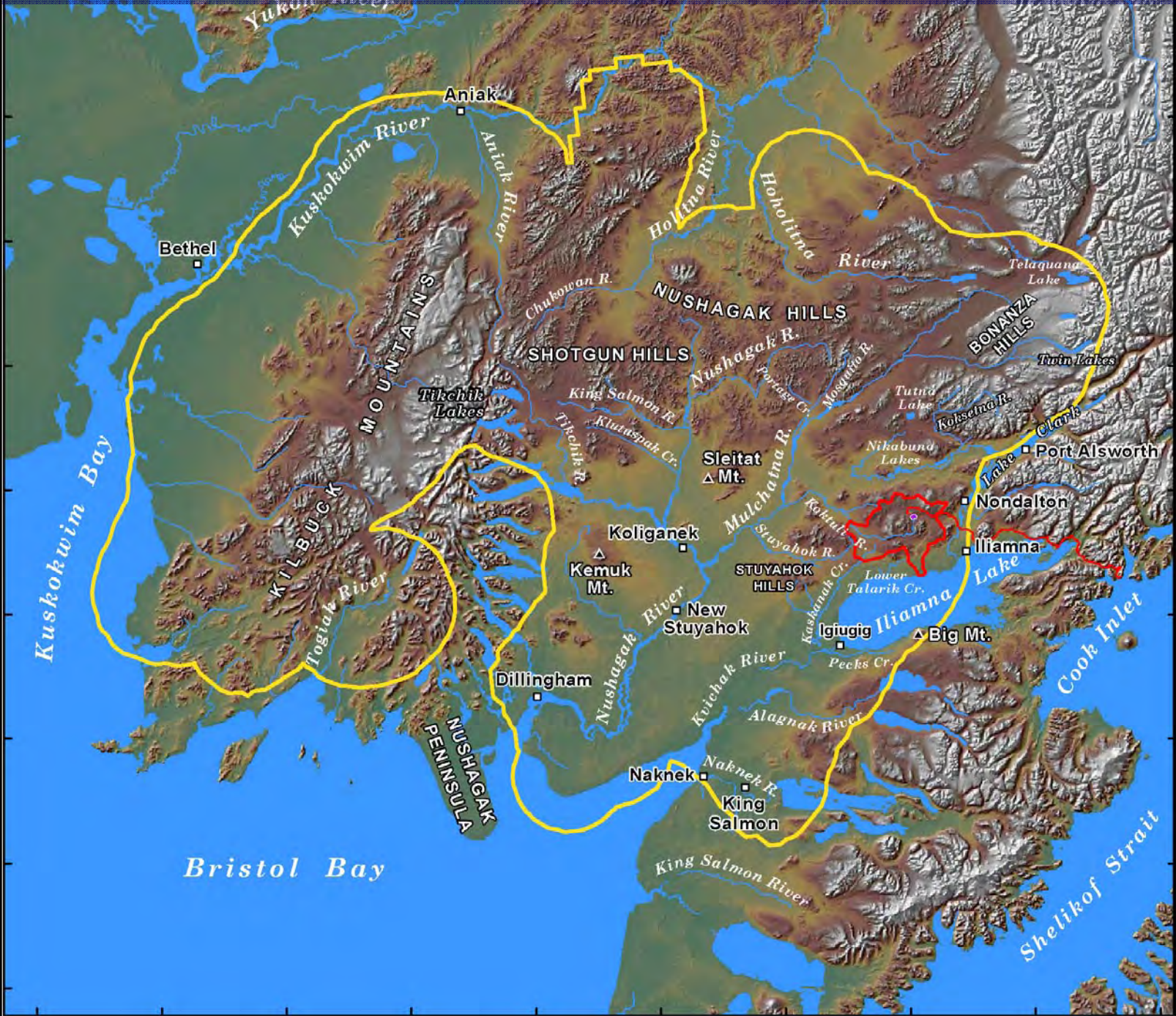
Methods: Mammals

- Species of primary interest: caribou, brown bear, moose, beaver, harbor seal; but all species included in literature review & baseline report
- Aerial surveys by fixed-wing airplane (~500 ft agl) of mine area & transportation corridor:
 - 2004 Apr, May, June, July, Oct, Nov
 - 2005 Mar, May, June, July, Oct, Dec
 - 2006 (mine area only) May 24, June 28, July 14, Dec 1–2
 - 2007 (mine area only) June 27, July 17
- Systematic strip transects in mine area (50–100% coverage) & western/central transportation corridor (12.5% coverage), with double-count detectability assessment; reconnaissance overflights in eastern transportation corridor

Methods: Mammals (cont.)

- Helicopter survey of bear concentrations on fish spawning streams in Aug 2004; similar data collected incidental to Harlequin Duck surveys in 2005
- Bear den checks by helicopter: Aug 2004; May & Aug 2005; May 2006
- Harbor seal photographic surveys (Mar–Dec 2005, May–Oct 2007) of Iliamna Lake haulouts (& coastal bays) by fixed-wing airplane at 1,000 ft agl
- Beaver colony surveys by helicopter: Oct 2005 (mine) & Oct 2006 (transportation corridor)

Mulchatna Caribou Range, 1981-2005



Legend

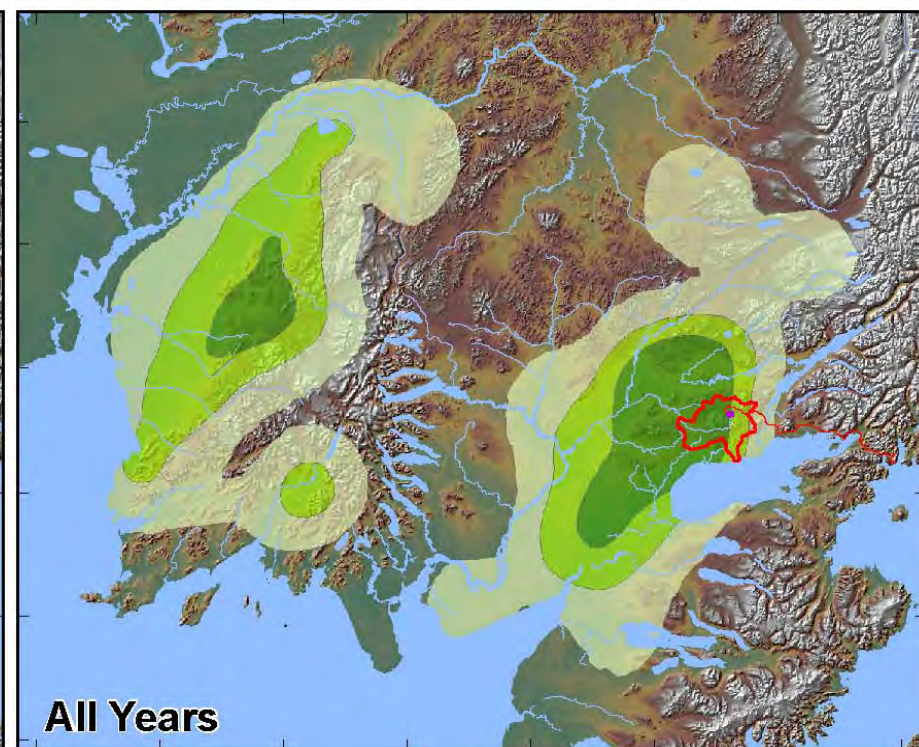
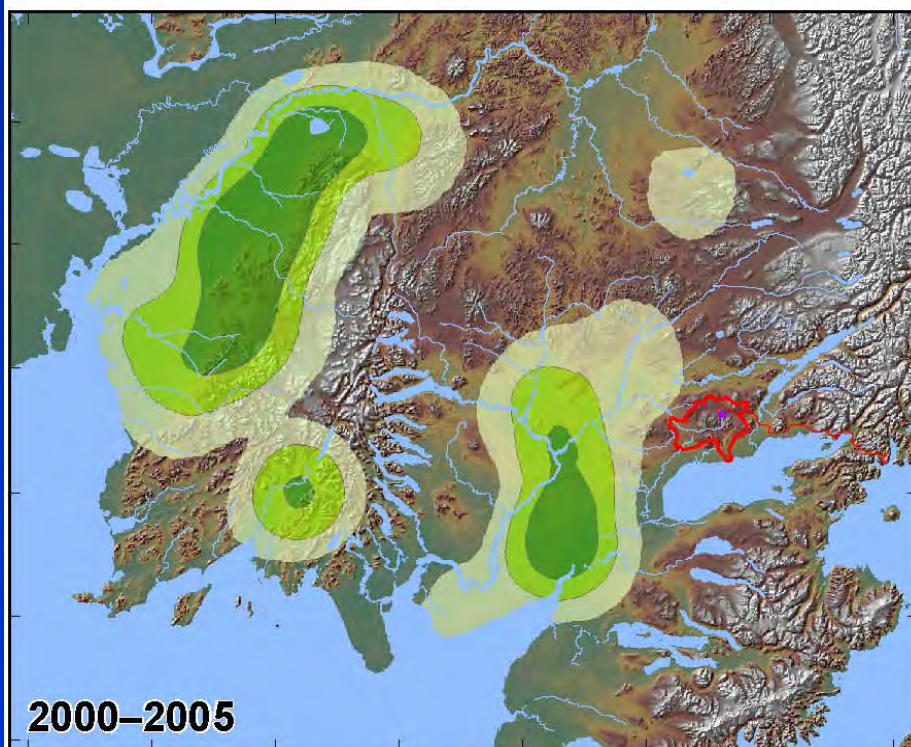
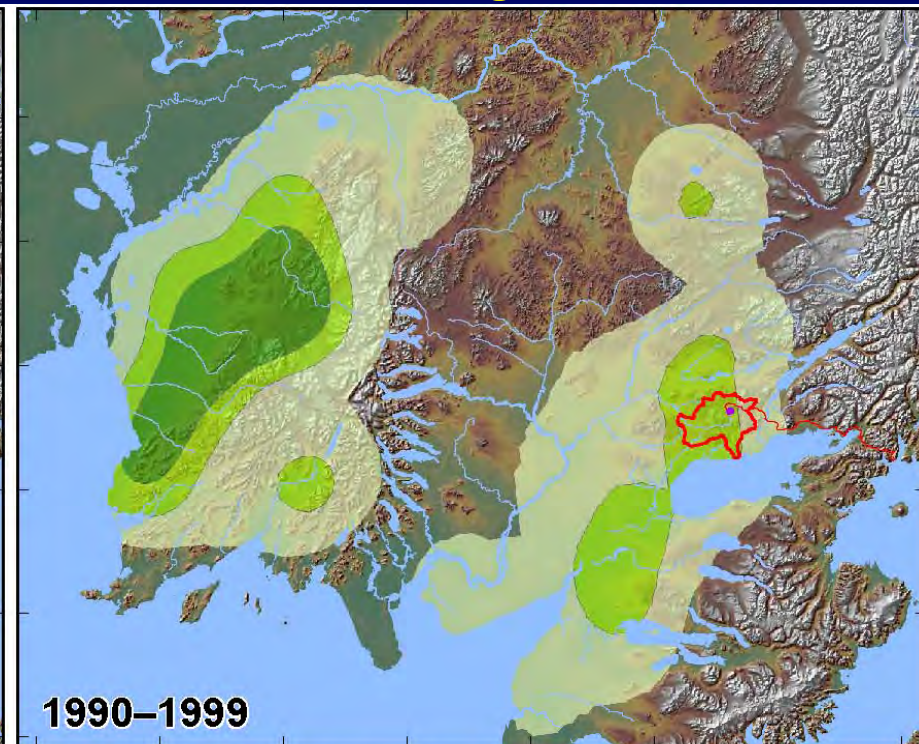
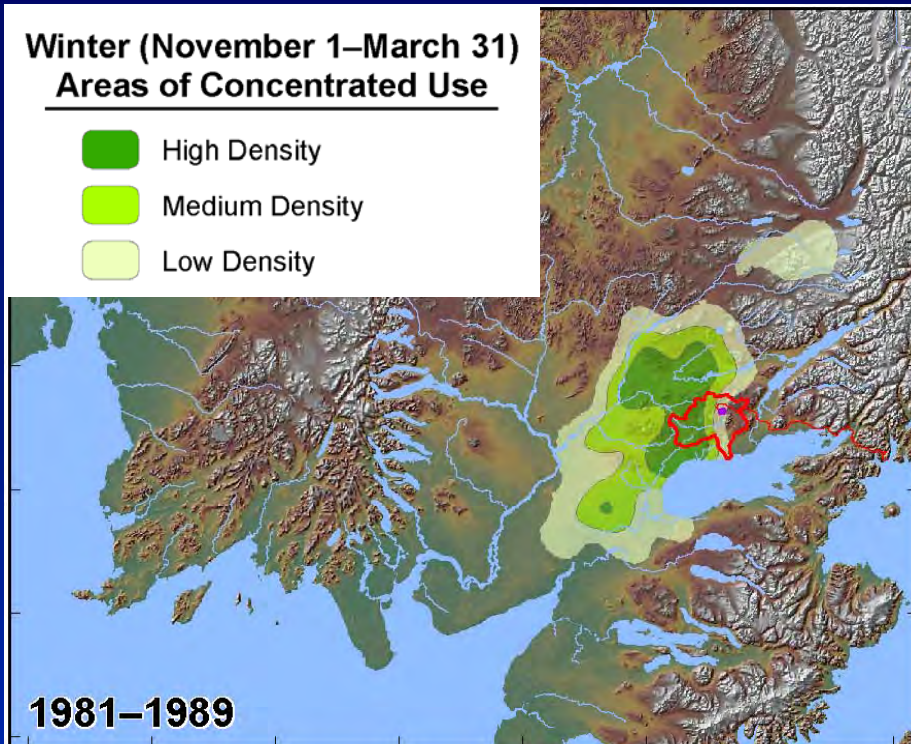
-  Mulchatna Caribou Herd Range
-  Greater Mine Area
-  General Pit Outline
-  Possible Road Alignment
-  Waterbody
-  River or Stream
-  Town or Village
-  Summit

276 VHF collars
 15 satellite collars
 5,736 locations
 6,426 observations

Mulchatna Caribou Herd: Winter Range Use

Winter (November 1–March 31)
Areas of Concentrated Use

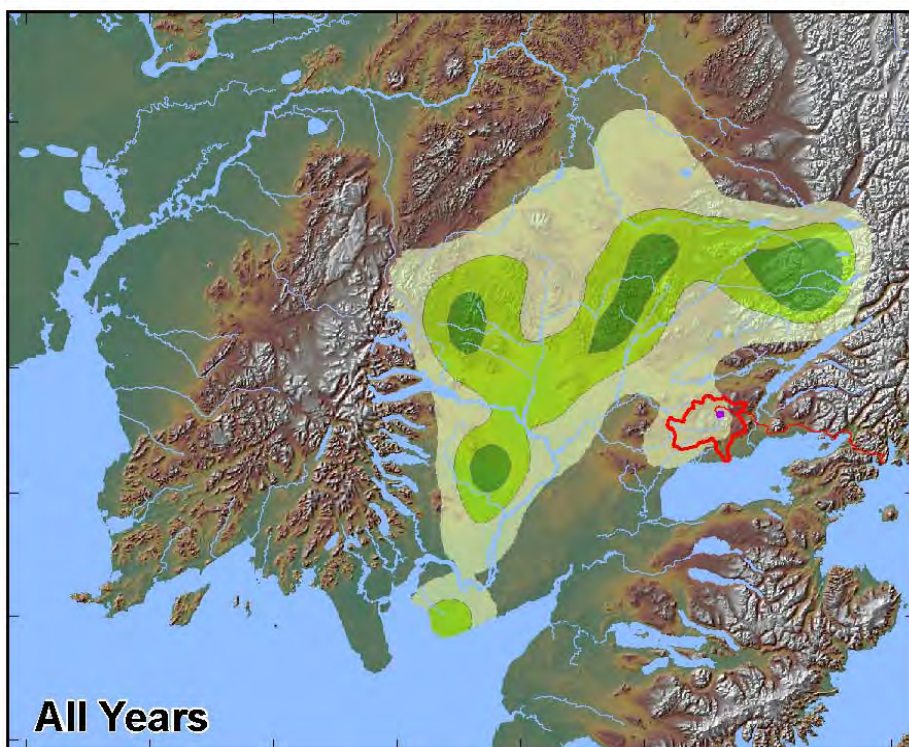
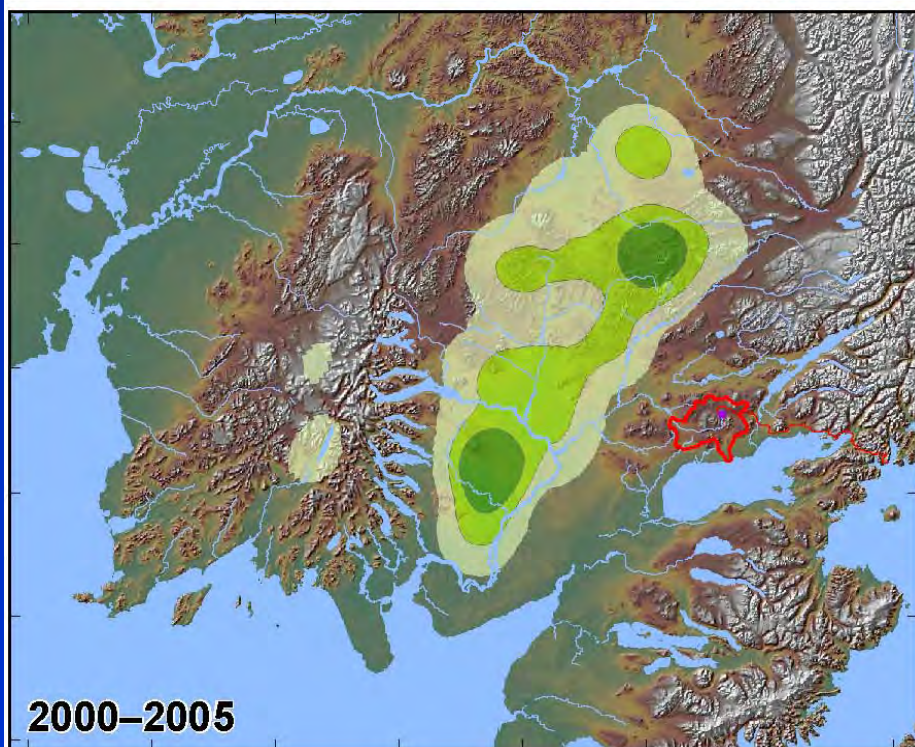
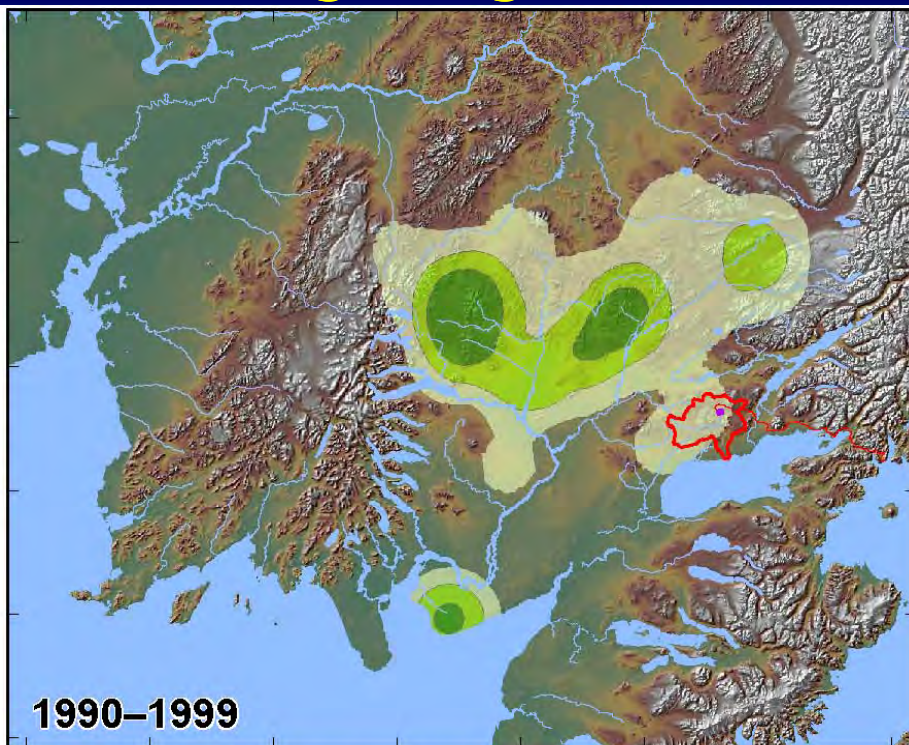
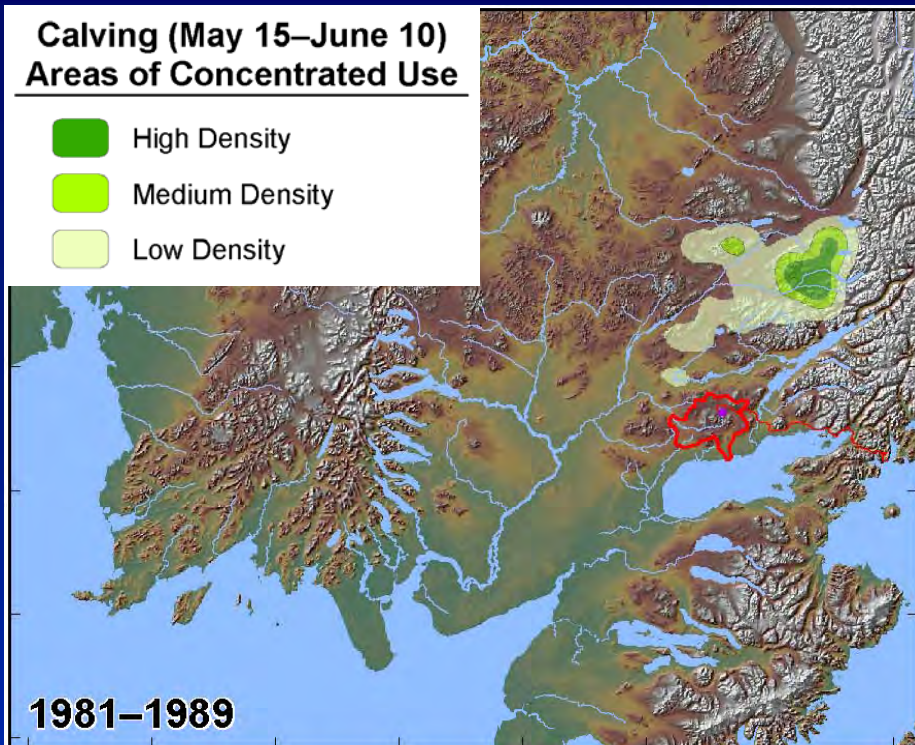
- High Density
- Medium Density
- Low Density



Mulchatna Caribou Herd: Calving Range Use

Calving (May 15–June 10)
Areas of Concentrated Use

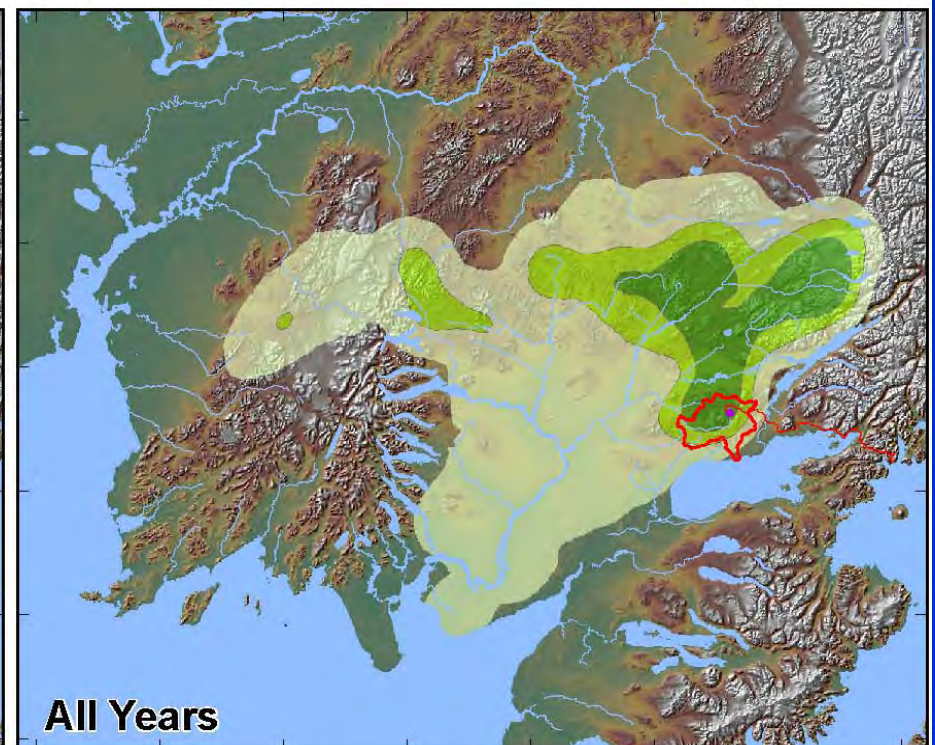
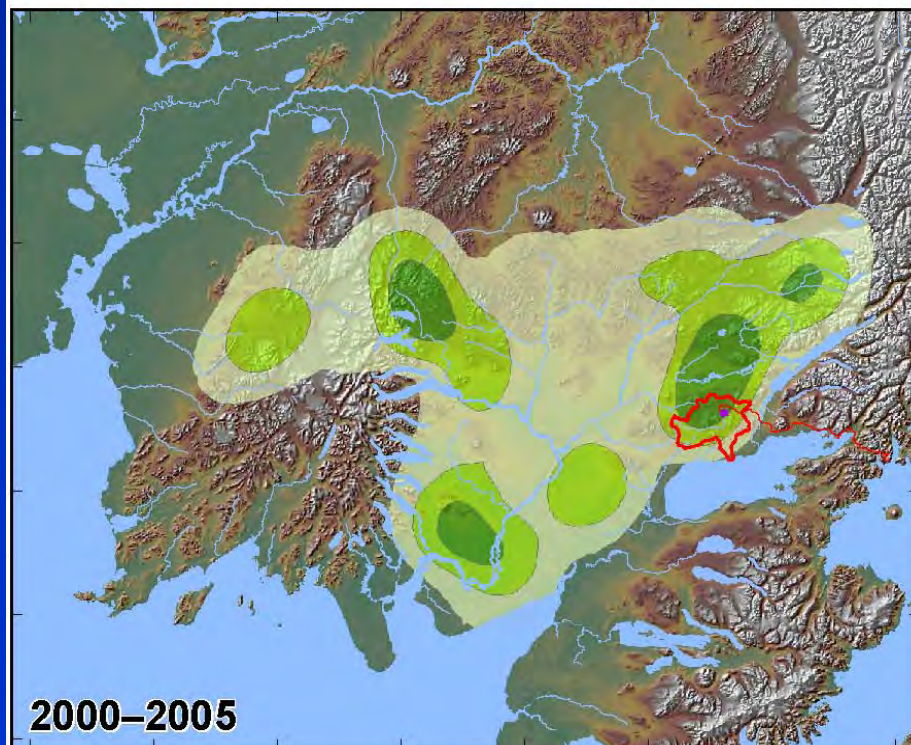
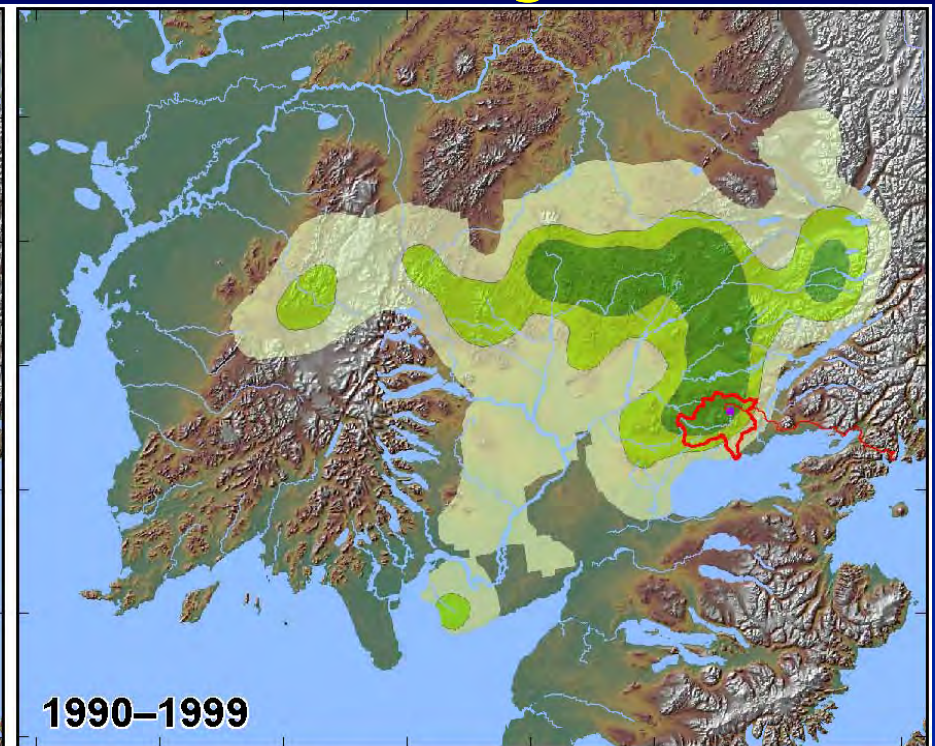
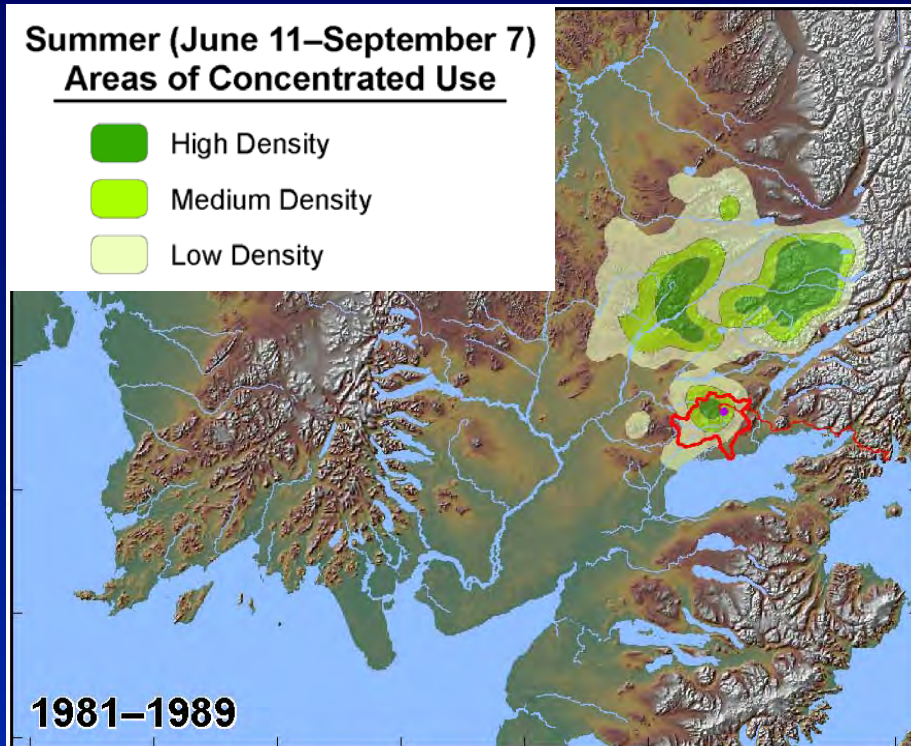
- High Density
- Medium Density
- Low Density



Mulchatna Caribou Herd: Summer Range Use

Summer (June 11–September 7)
Areas of Concentrated Use

- High Density
- Medium Density
- Low Density



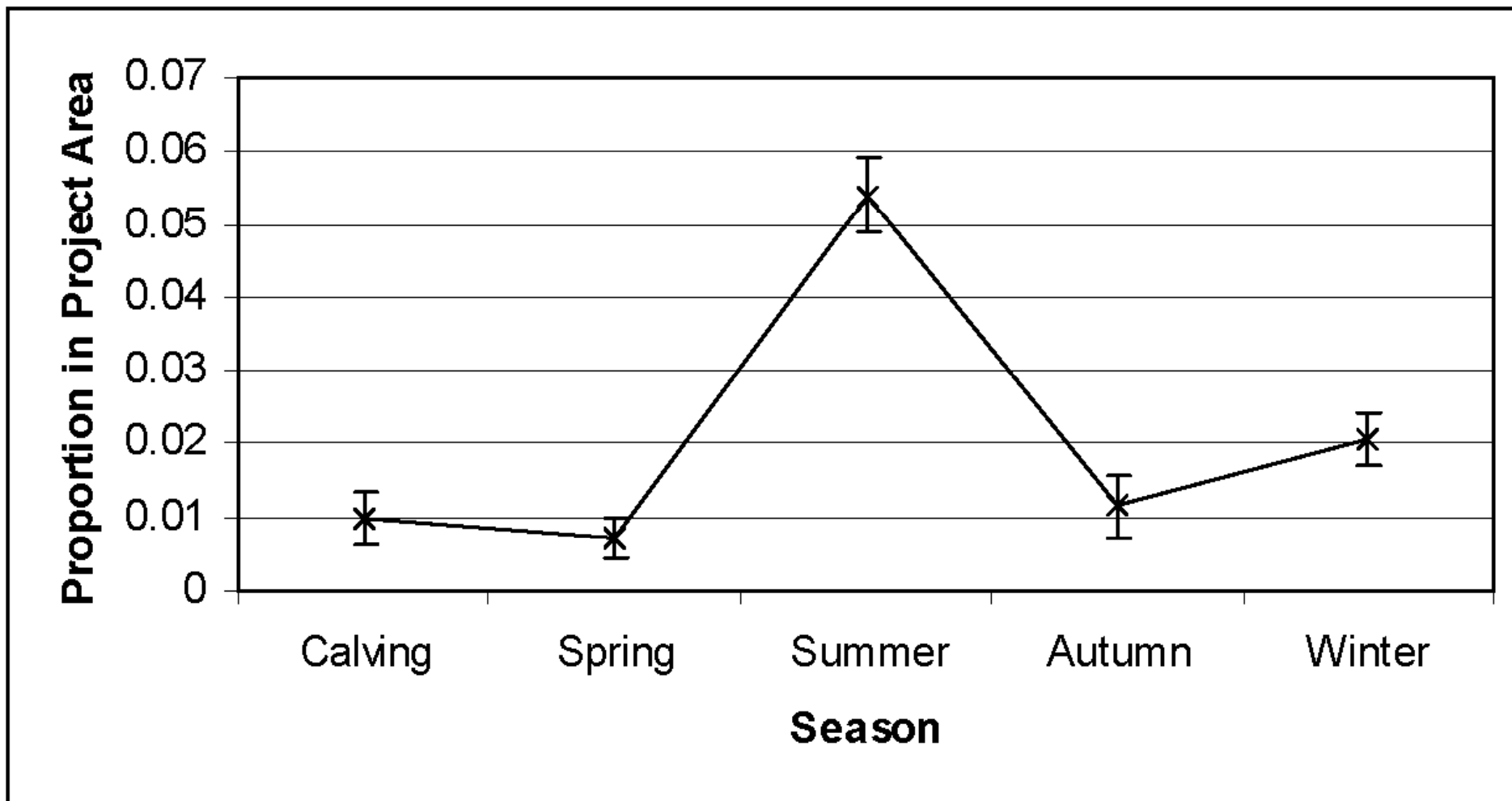
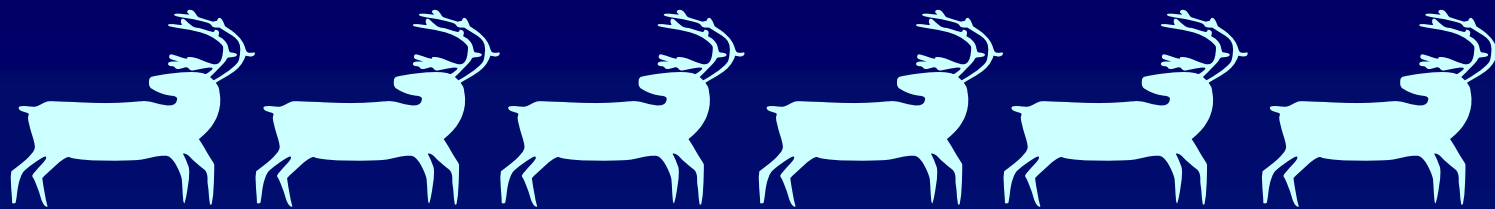
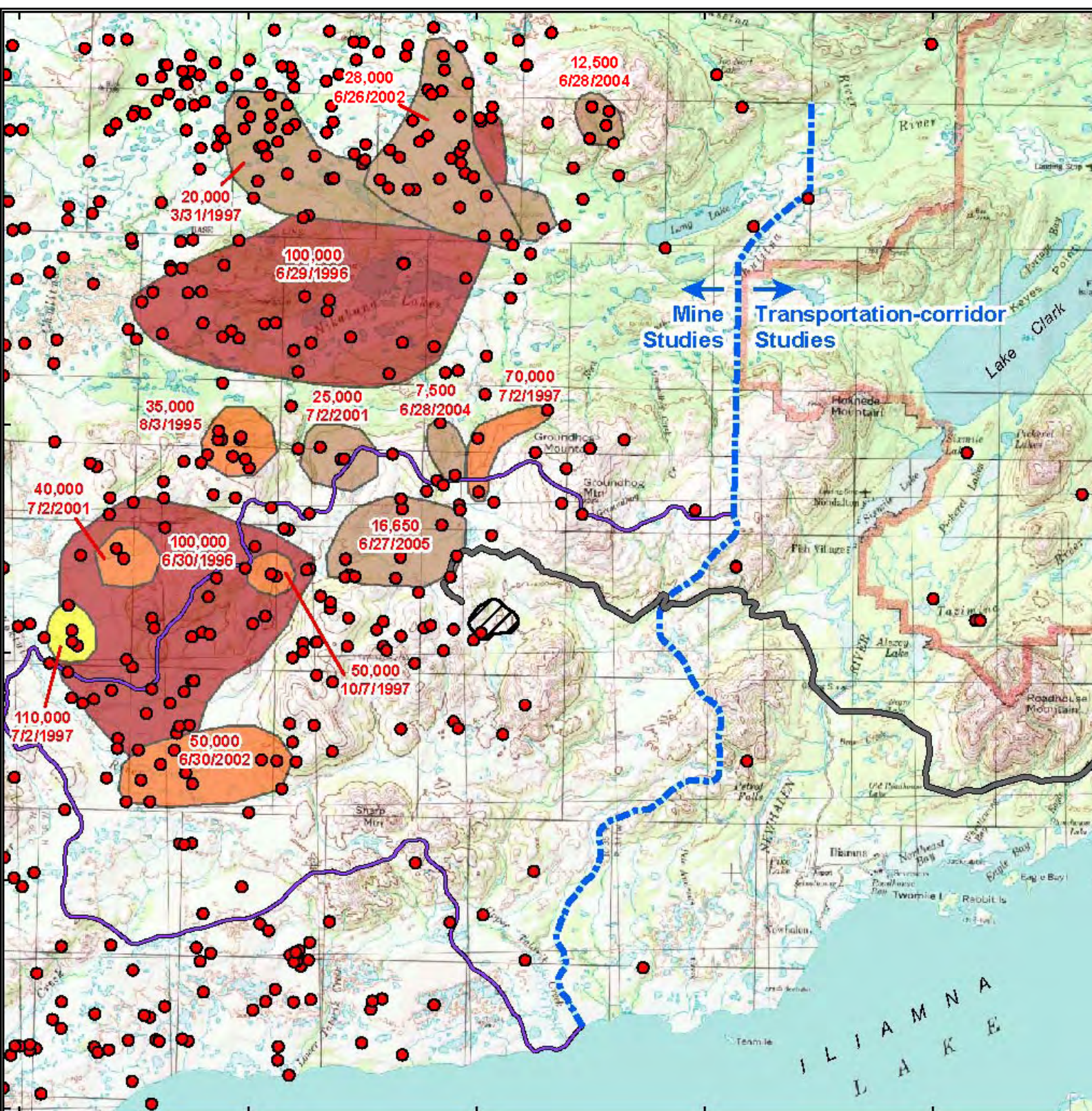


Figure 16.2-10. Proportion of radio-collared caribou locations in the greater mine area among seasons, Mulchatna Caribou Herd, Bristol Bay drainages, 1981-2005.

Caribou aggregations in Pebble vicinity, 1981-2005



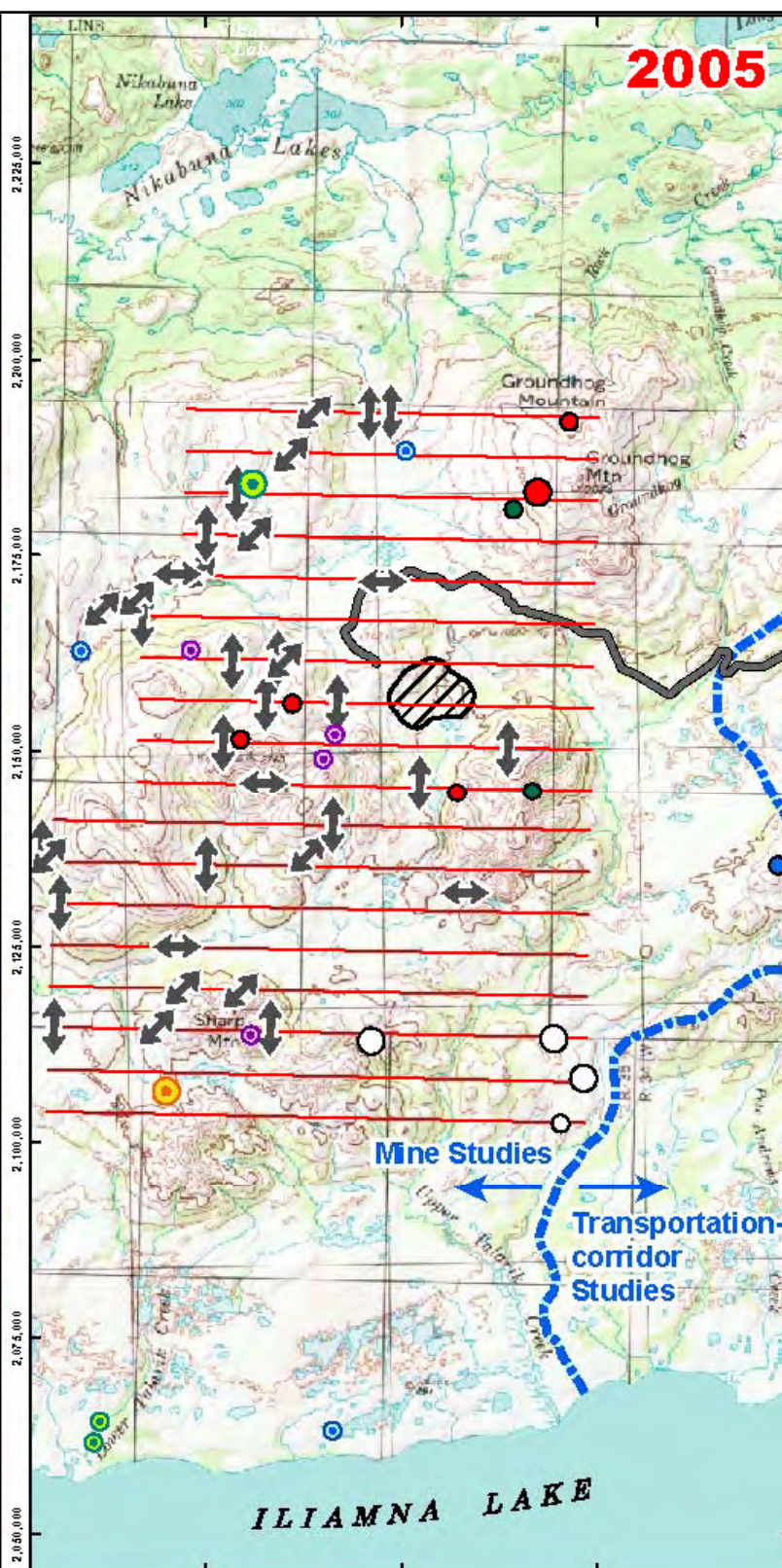
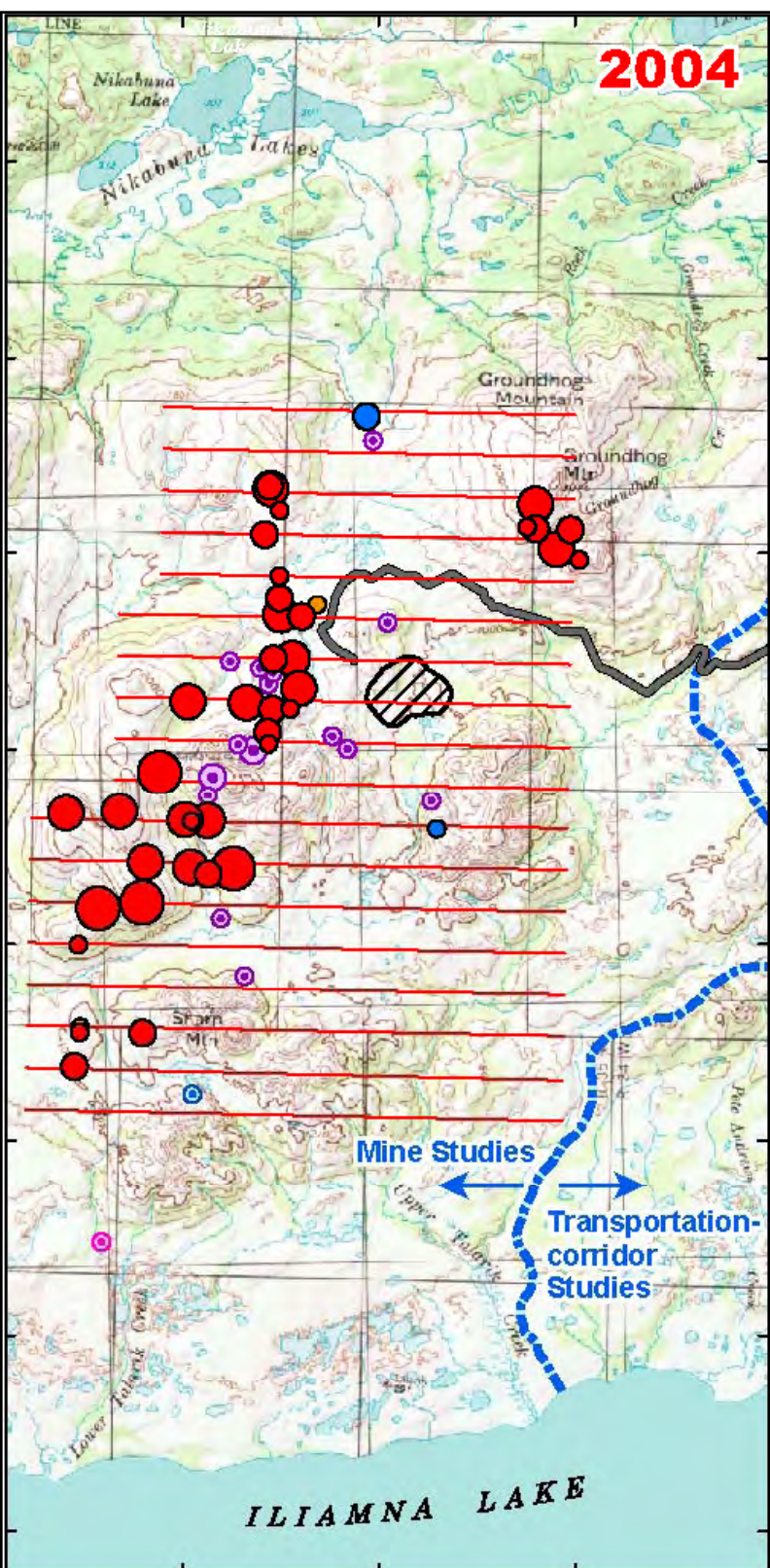
Legend

Group Size¹

- 7,500 – 30,000
- 30,001 – 70,000
- 70,001 – 100,000
- > 100,000
- Caribou Location

- Greater Mine Area
- General Pit Outline
- Possible Road Alignment

Source:
MCHTWG telemetry data set



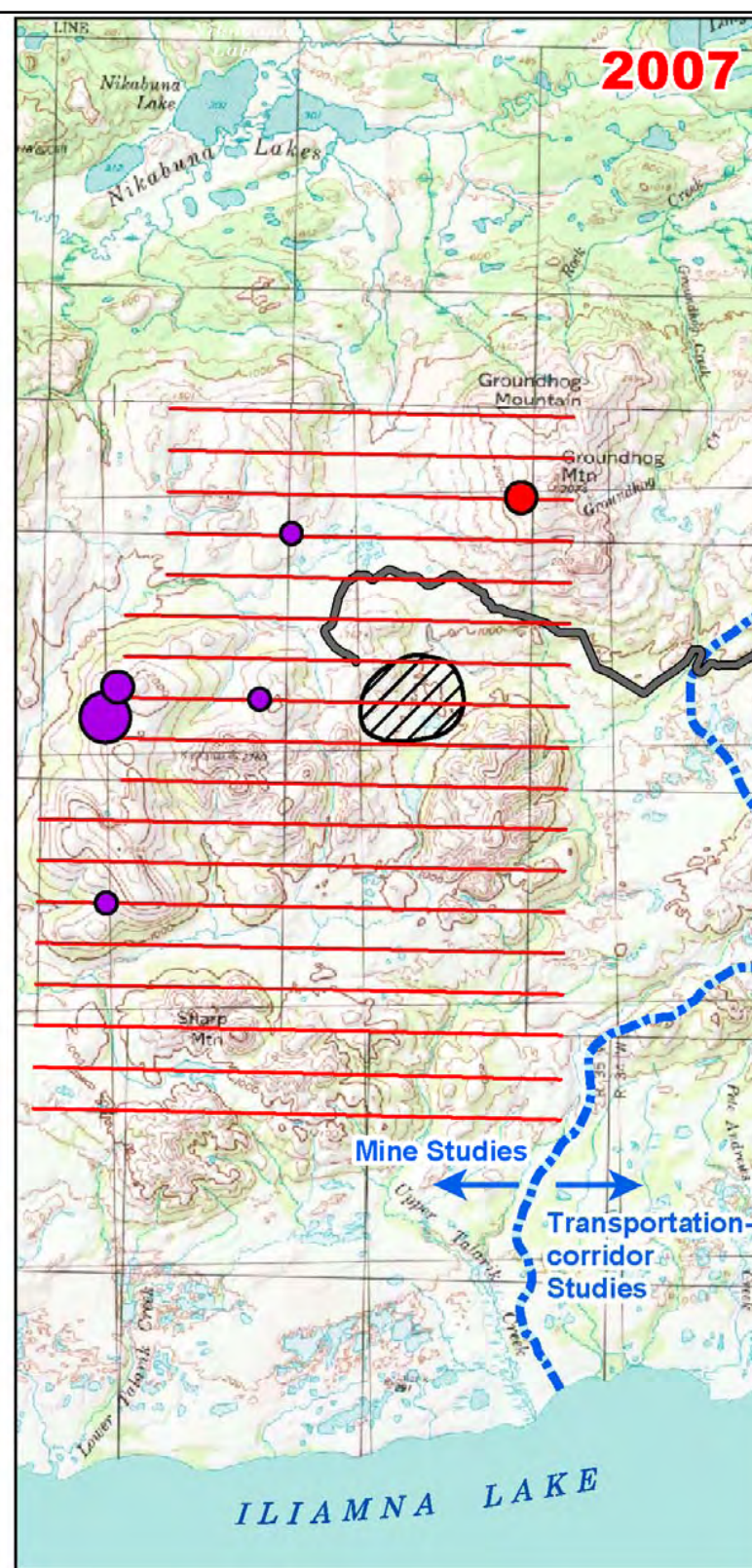
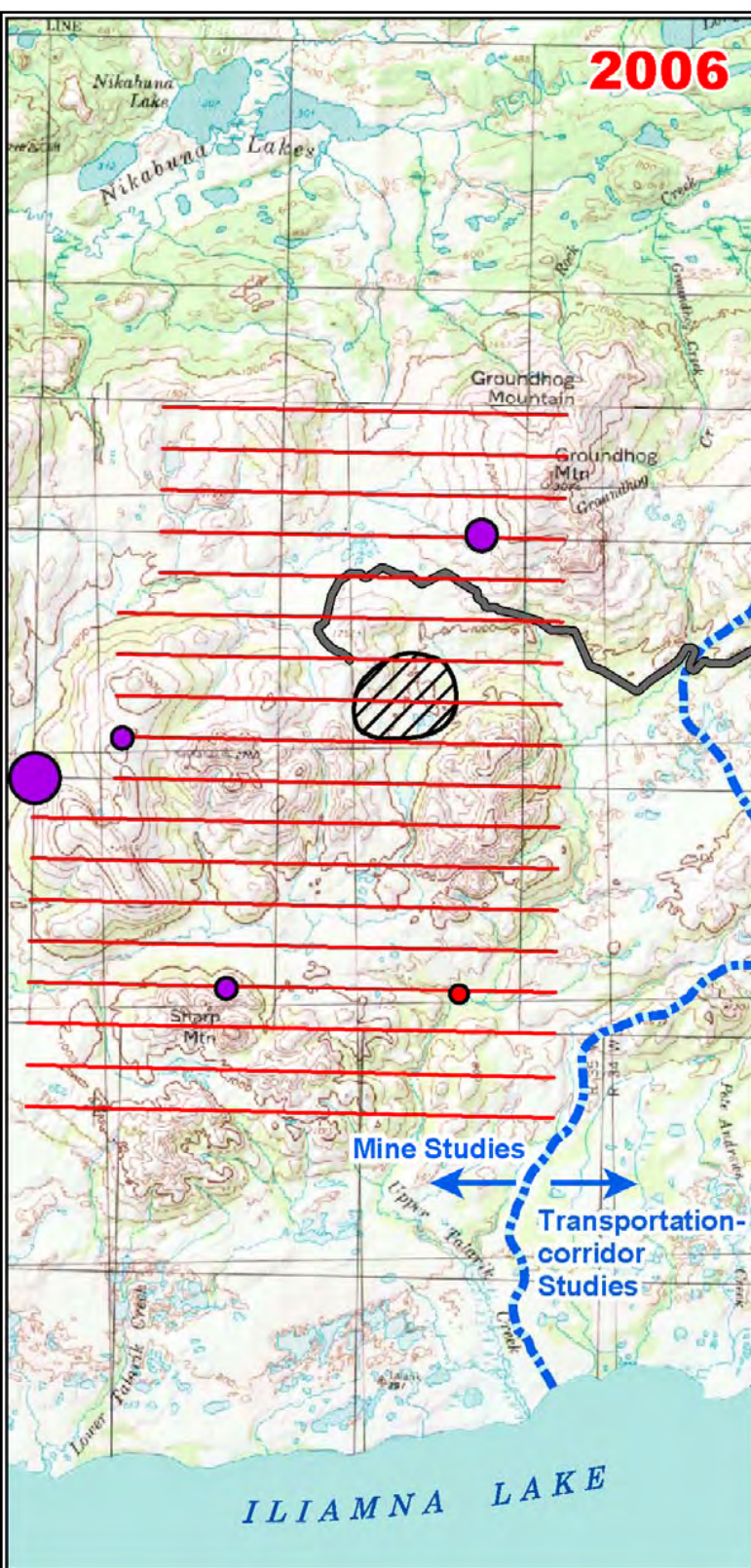
Caribou Observations, Mine Study Area

Legend

Group Size			
1-10	11-100	101-1000	>1000
Large Mammal Surveys		Other Surveys	
April			
May			
June			
July			
August			
October			
December			

1 July 2004:
9,963 caribou

12 Dec 2005:
145 caribou



Caribou Observations, Mine Study Area

Number of Individuals

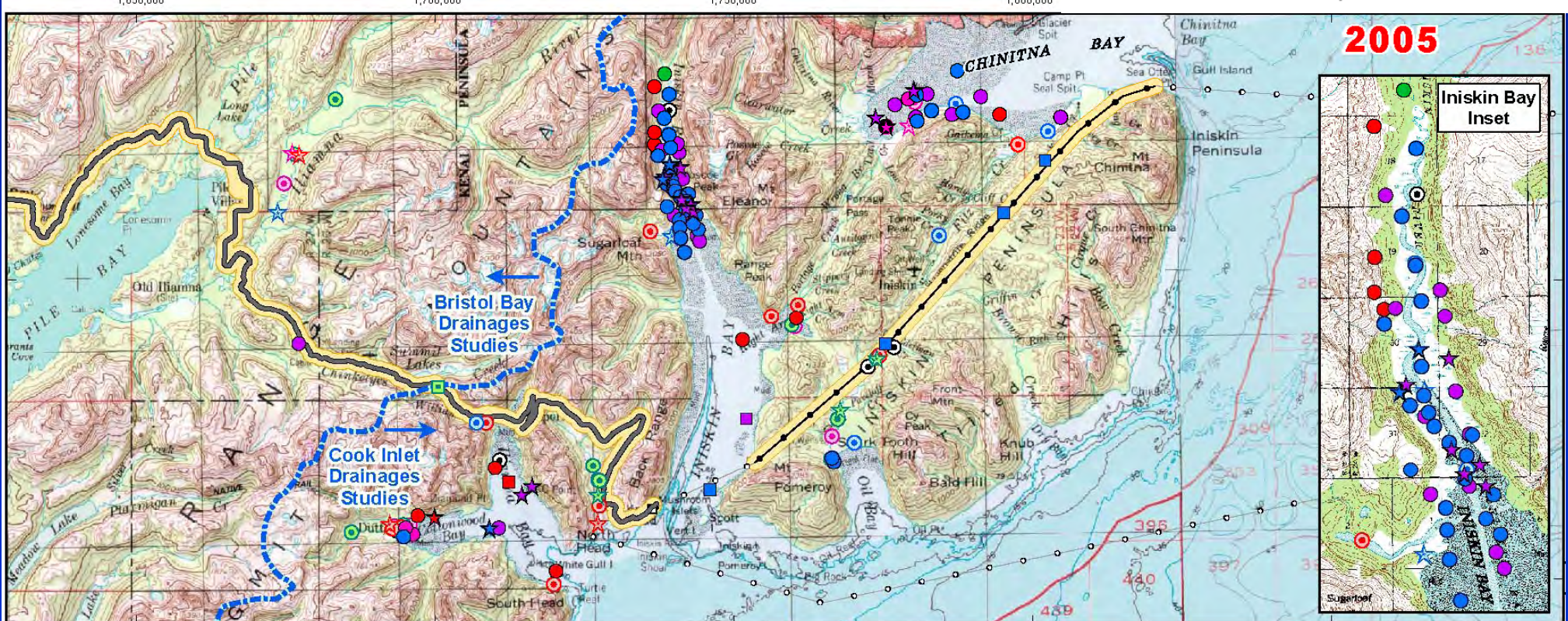
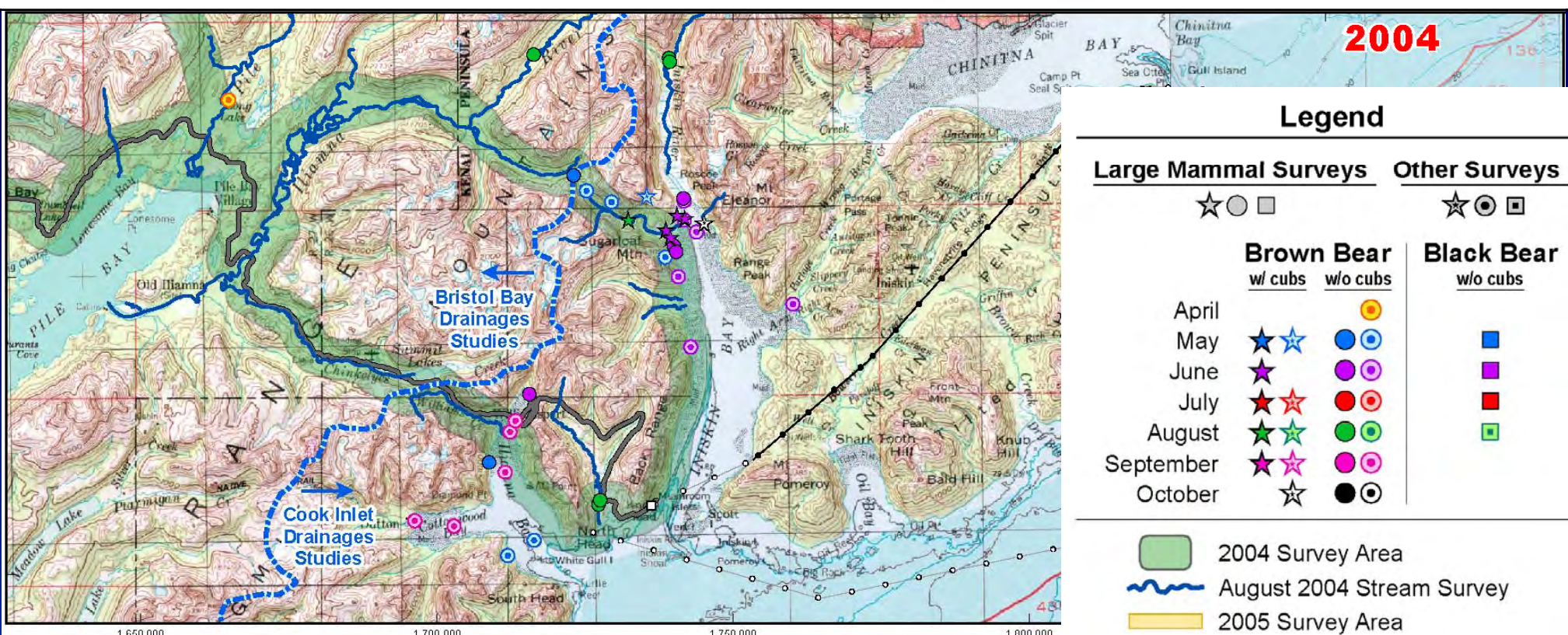
- 1 – 10
- 11 – 100
- > 2,000

Month

- June
- July




28 June 2006:
5,039 caribou

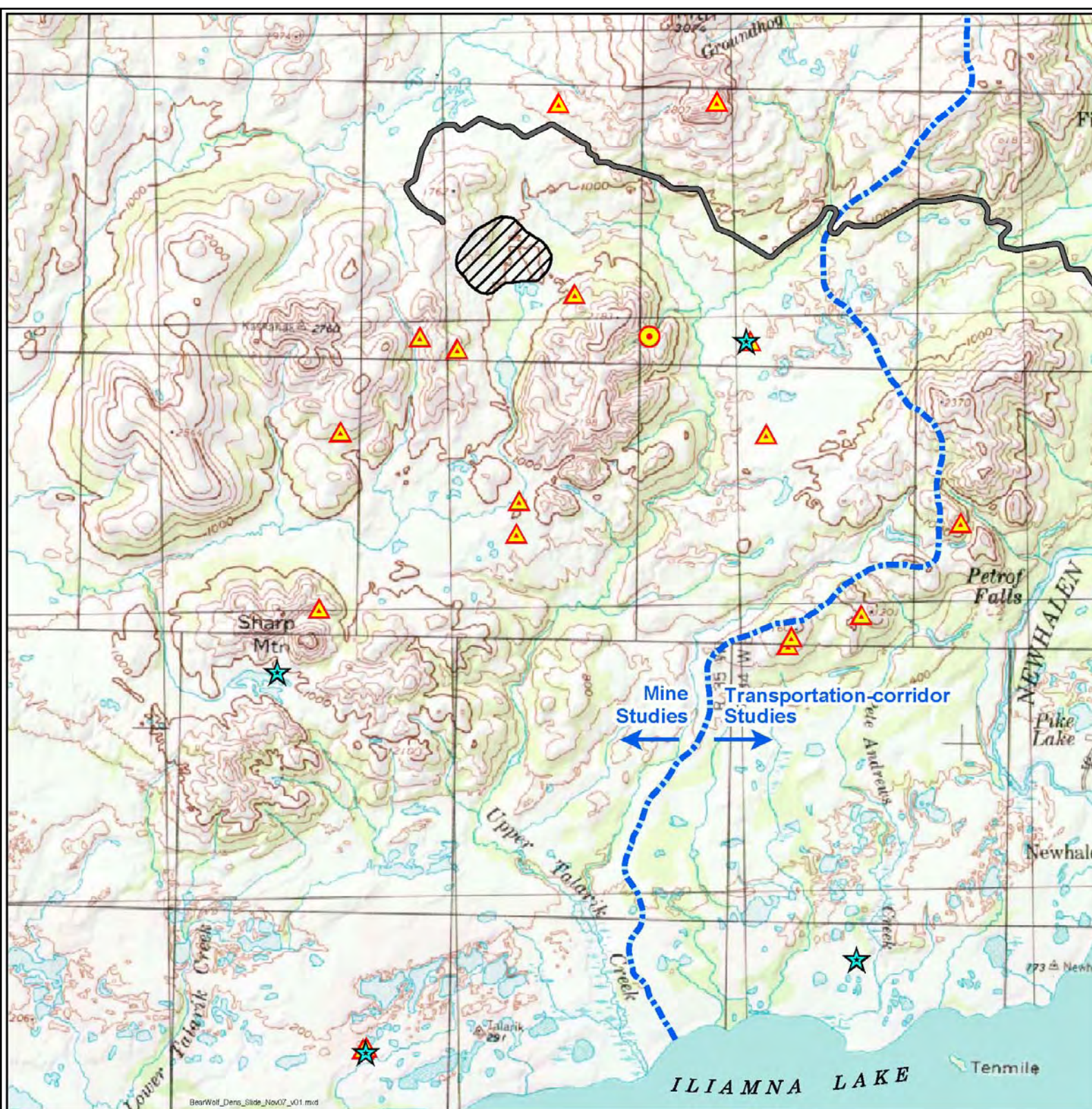
27 June 2007:
2,132 caribou



Brown Bear & Wolf Den Locations, Mine Study Area, 2004-2006

Legend

-  Confirmed Brown Bear Den
-  Probable Brown Bear Den
-  Confirmed Wolf Den



Harbor Seal Haulouts, Iliamna Lake, Mar-Dec 2005



Mean Number of Seals

- ★ 0 – 5
- ★ 6 – 25
- ★ 26 – 56

- 2005 Iliamna Lake Seal Survey Area
- Road Alignment
- Proposed Transmission Line

**Maximal count =
276 seals
17 Aug 2005**

Harbor Seal Haulouts, Iliamna Lake, May–Oct 2007



Legend

Mean Number of Seals

- ★ 0 – 5
- ★ 6 – 25
- ★ 26 – 48

Maximal count =
311 seals
14 Aug 2007

Assessment of 2004–2007 work: Mammals

- Surveys to date generally accomplished as planned; aerial-survey design modified to address ADFG concerns regarding detectability, facilitated by direct interaction
- Continuing review of literature, agency reports & survey data for inclusion in draft baseline report (in progress)
- Through newly instituted wildlife TWG process, planning cooperative telemetry study of brown bears & trace-element tissue sampling (brown bears, lake seals) for 2008
- Exploring possibilities for more detailed moose population surveys & tissue sampling of arctic ground squirrels in 2008
- Local residents (Newhalen, Pedro Bay) participated in some aerial surveys; plans for involvement in lake seal sampling