Temporal use of the Nushagak Peninsula by wolves, Togiak National Wildlife Refuge, southwestern Alaska

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Goal:

Bottom up or top down control?

- **Assess whether wolf predation is the likely driver of Nushagak Peninsula caribou population dynamics**

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Bristol Bay
Gulf of Alaska
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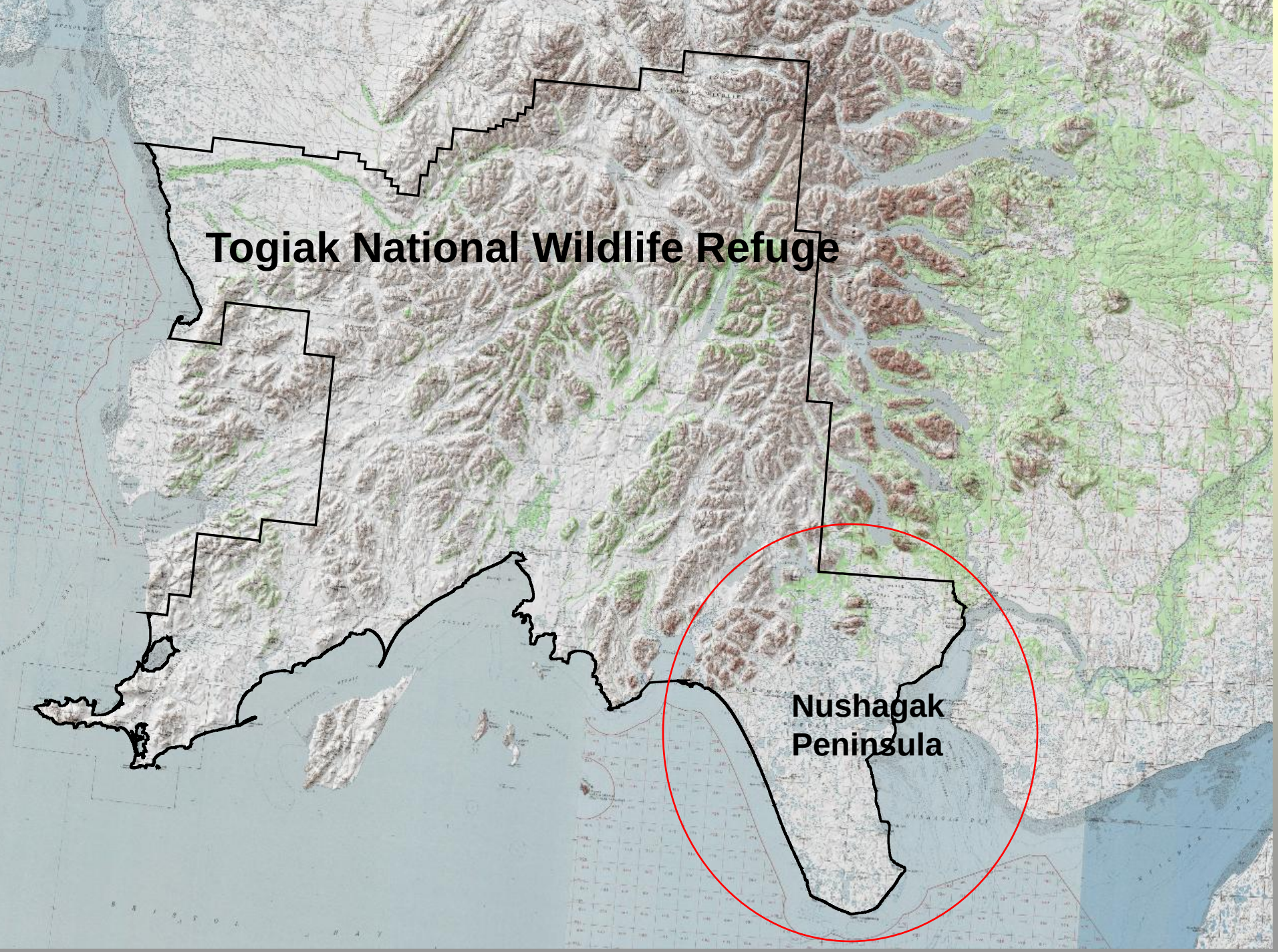
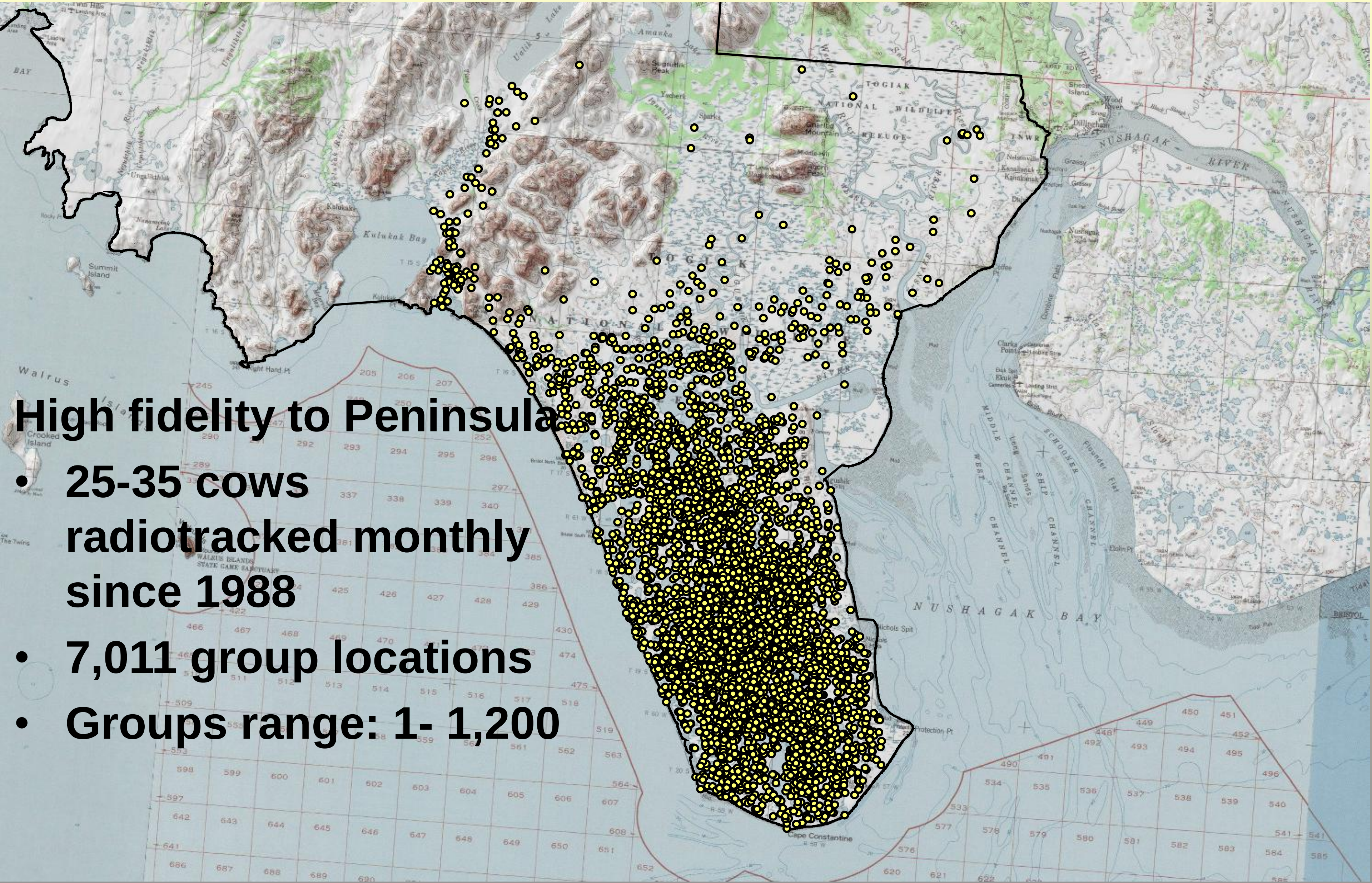

Togiak National Wildlife Refuge
Nushagak
Peninsula

Caribou status on Nushagak Peninsula

- **Caribou introduced in 1988 after ~100 year absence**

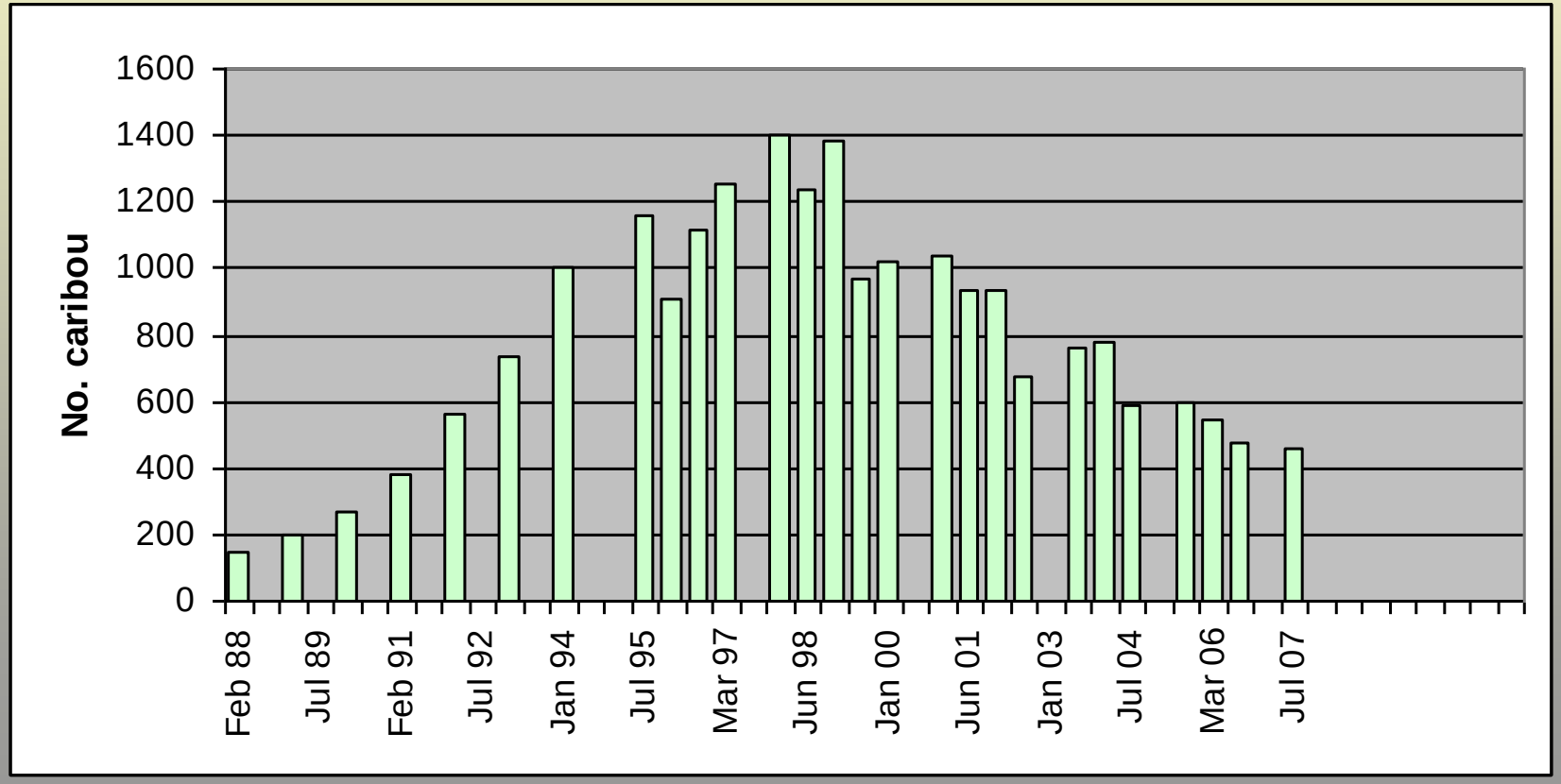
Nushagak Peninsula caribou distribution

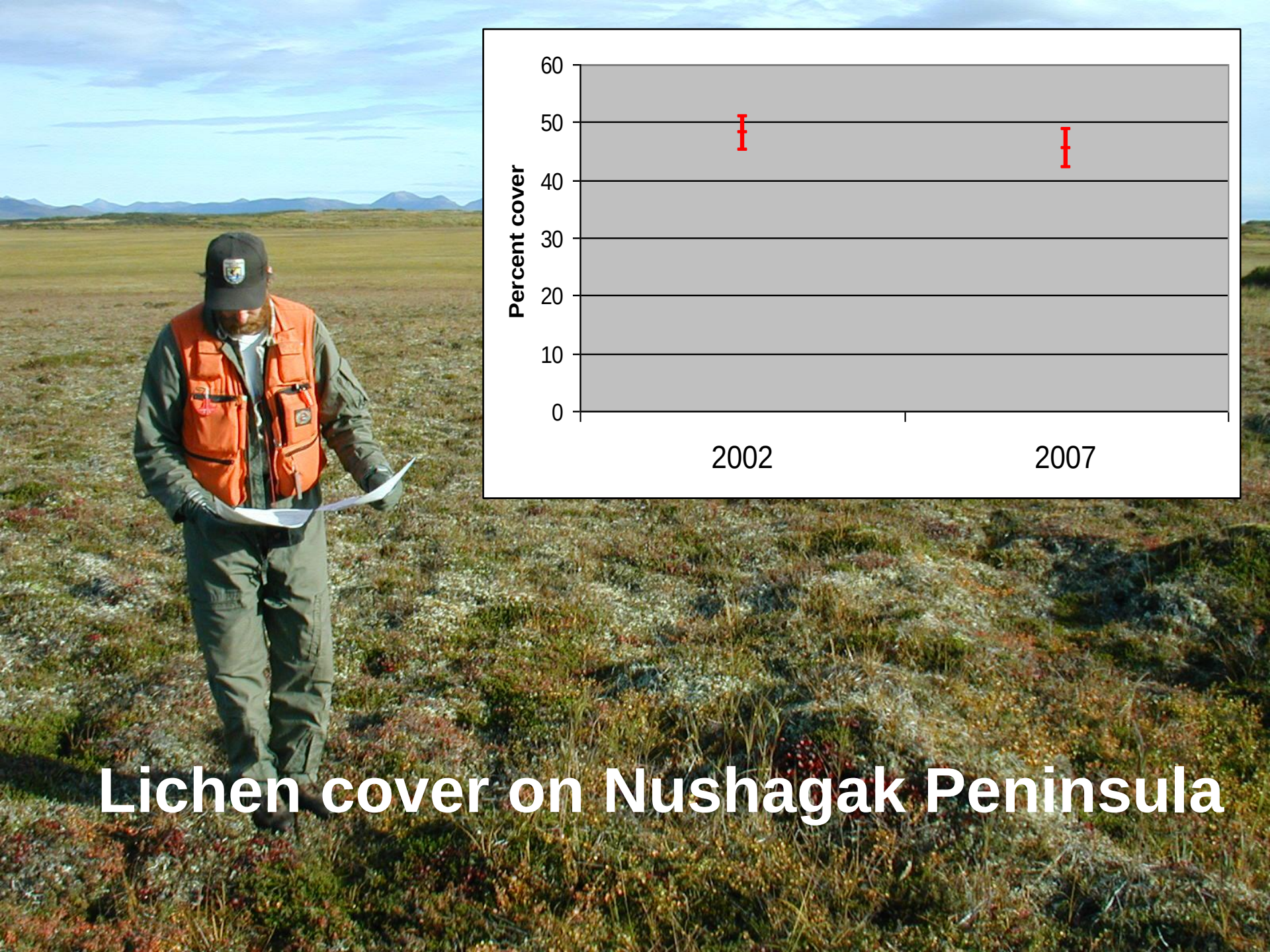


High fidelity to Peninsula

- **25-35 cows radiotracked monthly since 1988**
- **7,011 group locations**
- **Groups range: 1- 1,200**

Nushagak Peninsula caribou population, 1988-2007

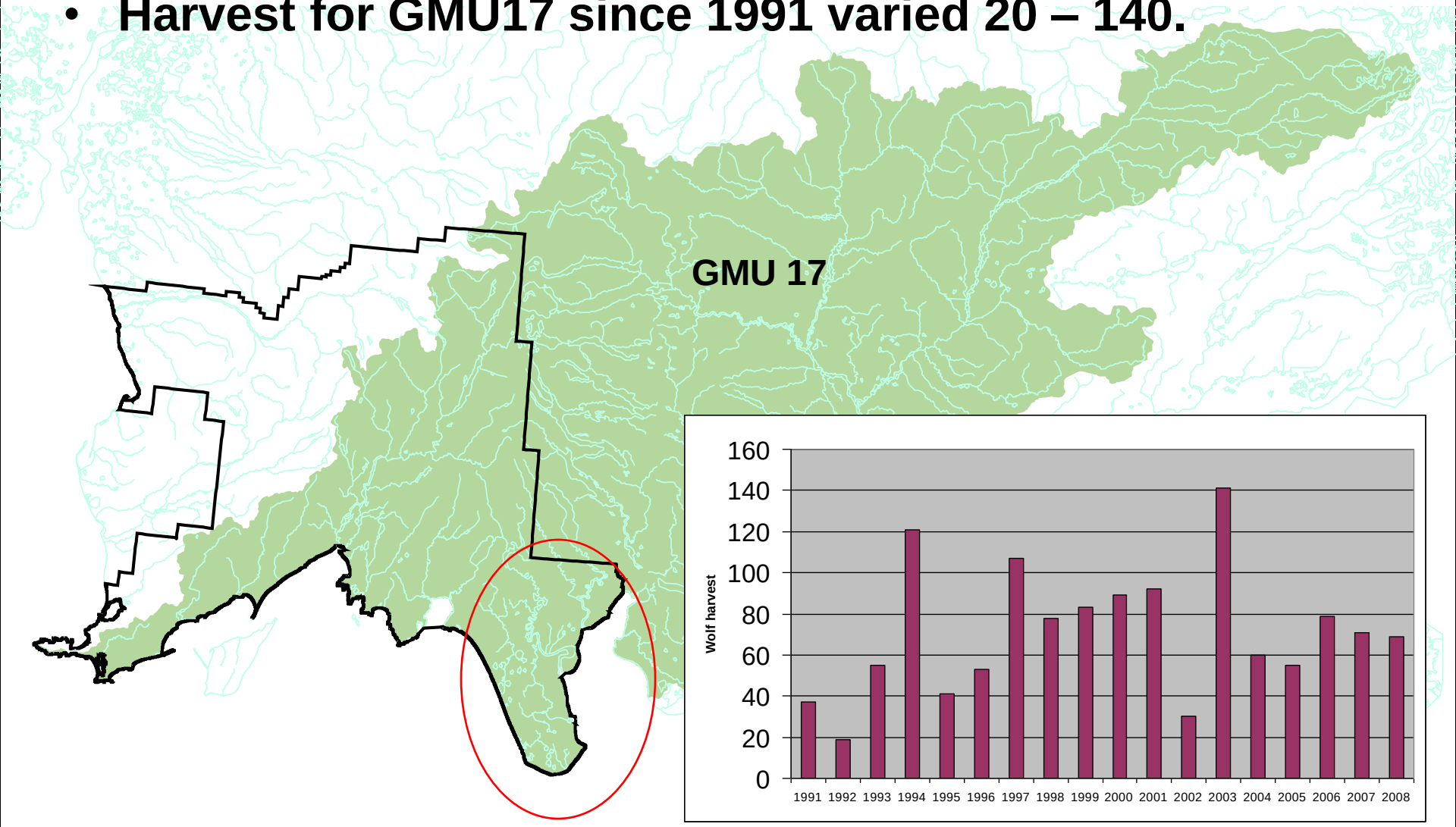




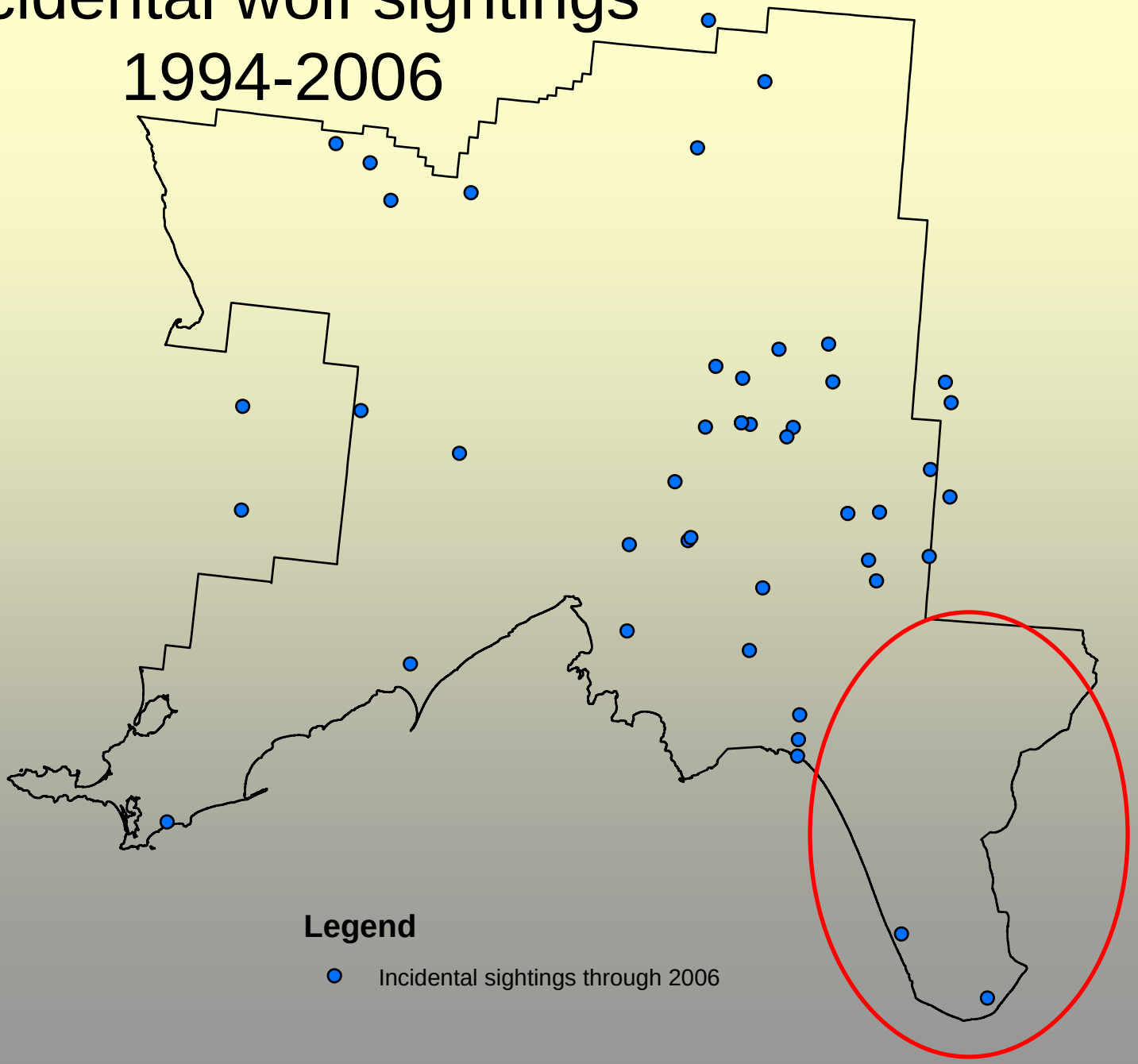
Lichen cover on Nushagak Peninsula

Wolf status in study area

- **No population estimate available.**
- **Harvest for GMU17 since 1991 varied 20 – 140.**



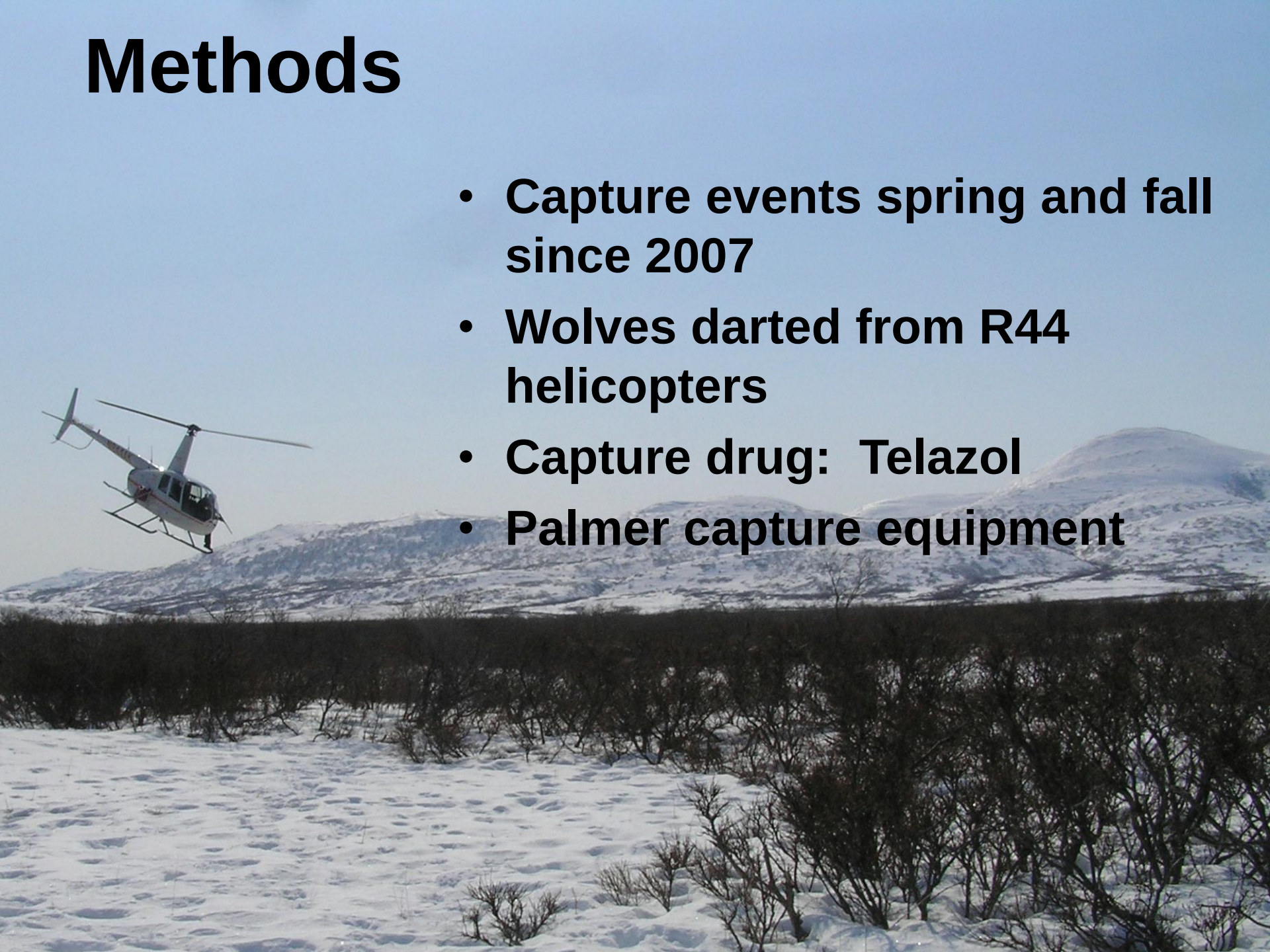
Incidental wolf sightings 1994-2006



Objectives

1. Determine number and size of wolf packs near Nushagak Peninsula.
2. Determine seasonality and proportion of time that wolves spend on the NP.
3. Relate wolf use of the NP to caribou demographics.

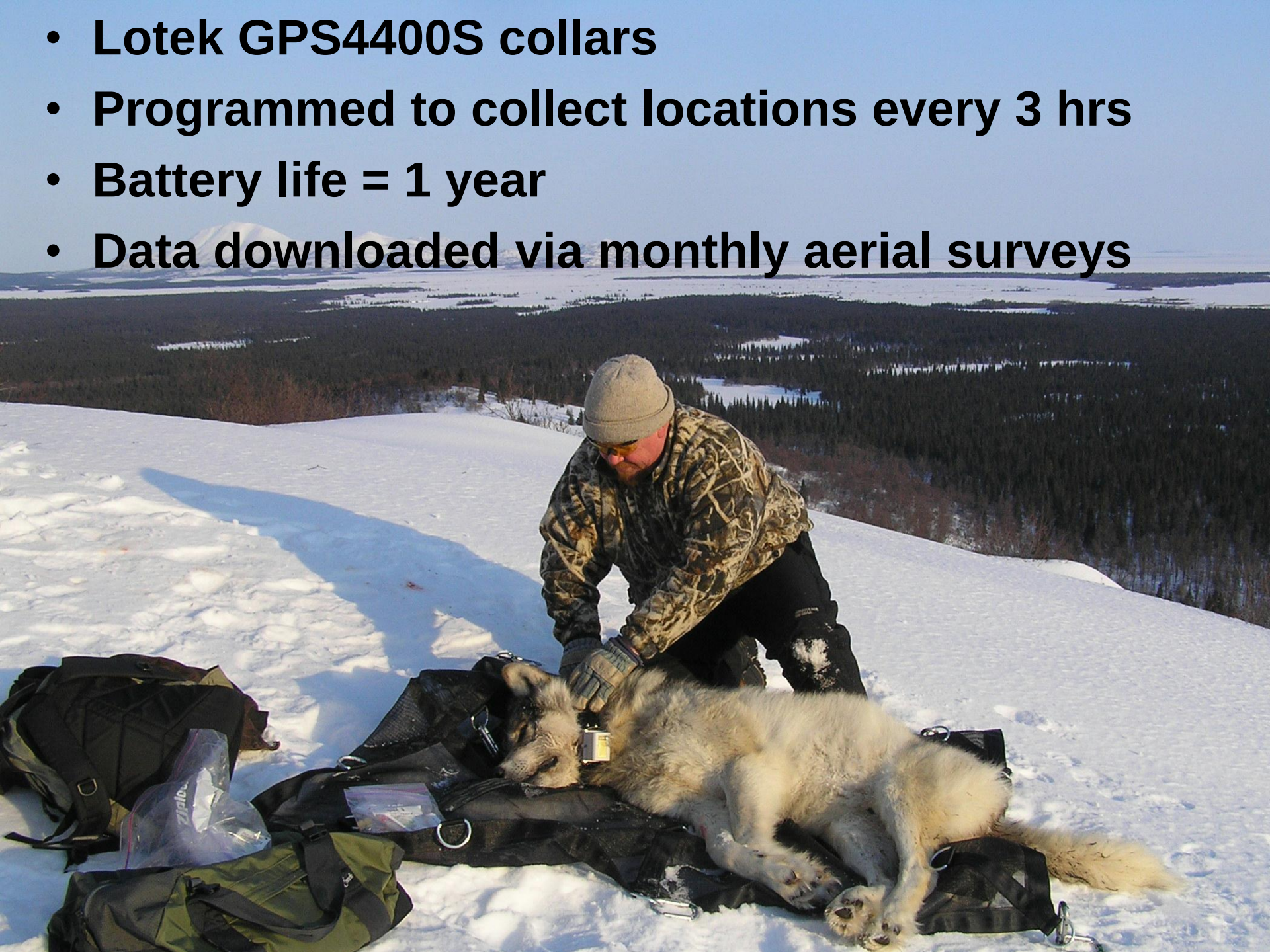
Methods

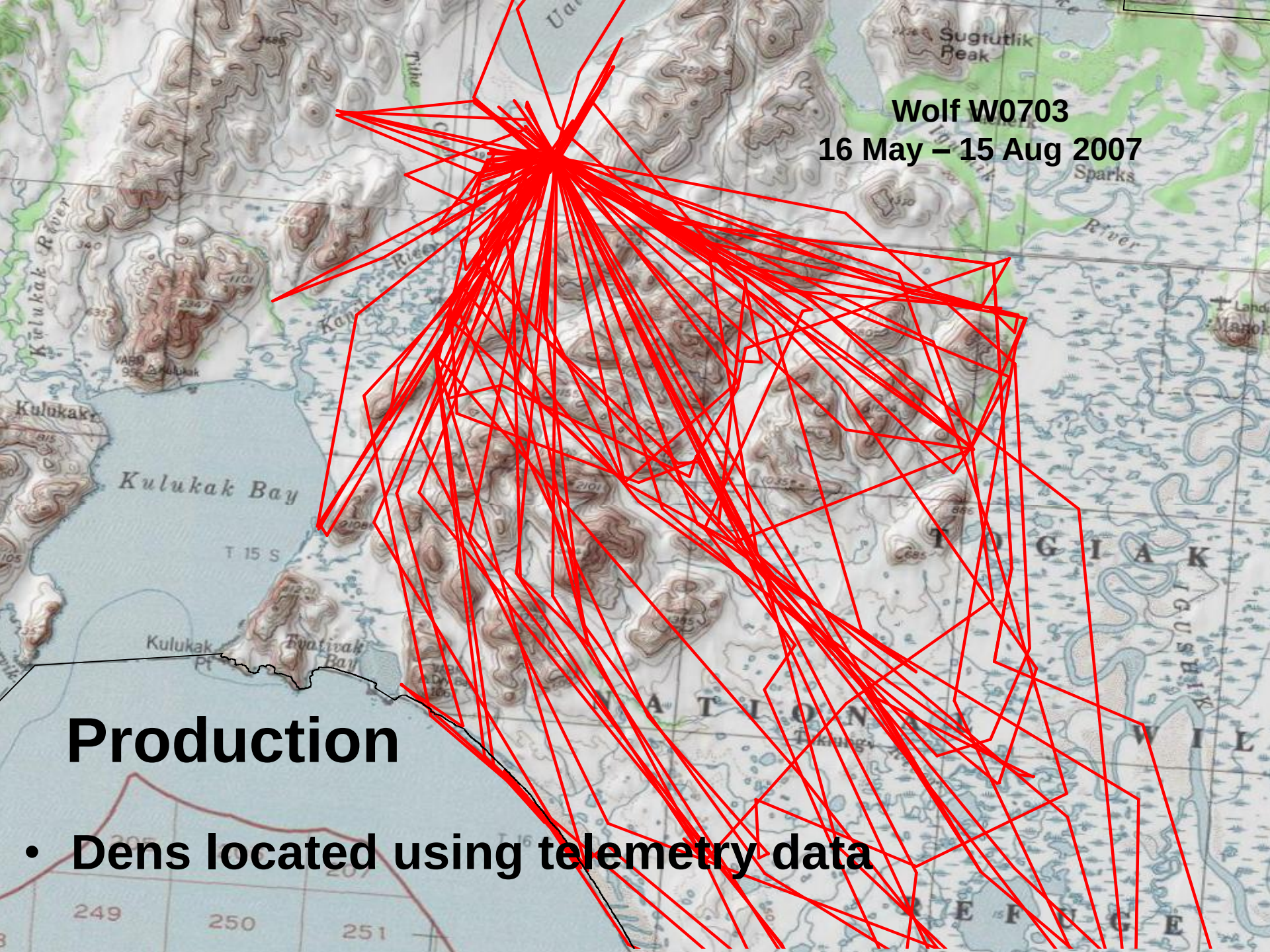


- Capture events spring and fall since 2007
- Wolves darted from R44 helicopters
- Capture drug: Telazol
- Palmer capture equipment

- **Wolves sexed, aged**
- **Body measurements**
- **Genetic and stable isotope samples collected**

- Lotek GPS4400S collars
- Programmed to collect locations every 3 hrs
- Battery life = 1 year
- Data downloaded via monthly aerial surveys





Production

- Dens located using telemetry data

Den watches

- Annually in July
- Ten dens located
- Pup production ranged from 3-9

Analysis

- **Peninsula delineated by area containing 95% of caribou locations, 1988-2006**
- **Wolf use summarized by season**

Winter	1 December – 15 May
Early denning/caribou calving	16 May – 30 June
Late denning	1 July – 15 August
Late summer	16 August – 15 September
Fall/caribou rut, postrut	16 September – 30 November

- **Wolf Peninsula-Days calculated as:**

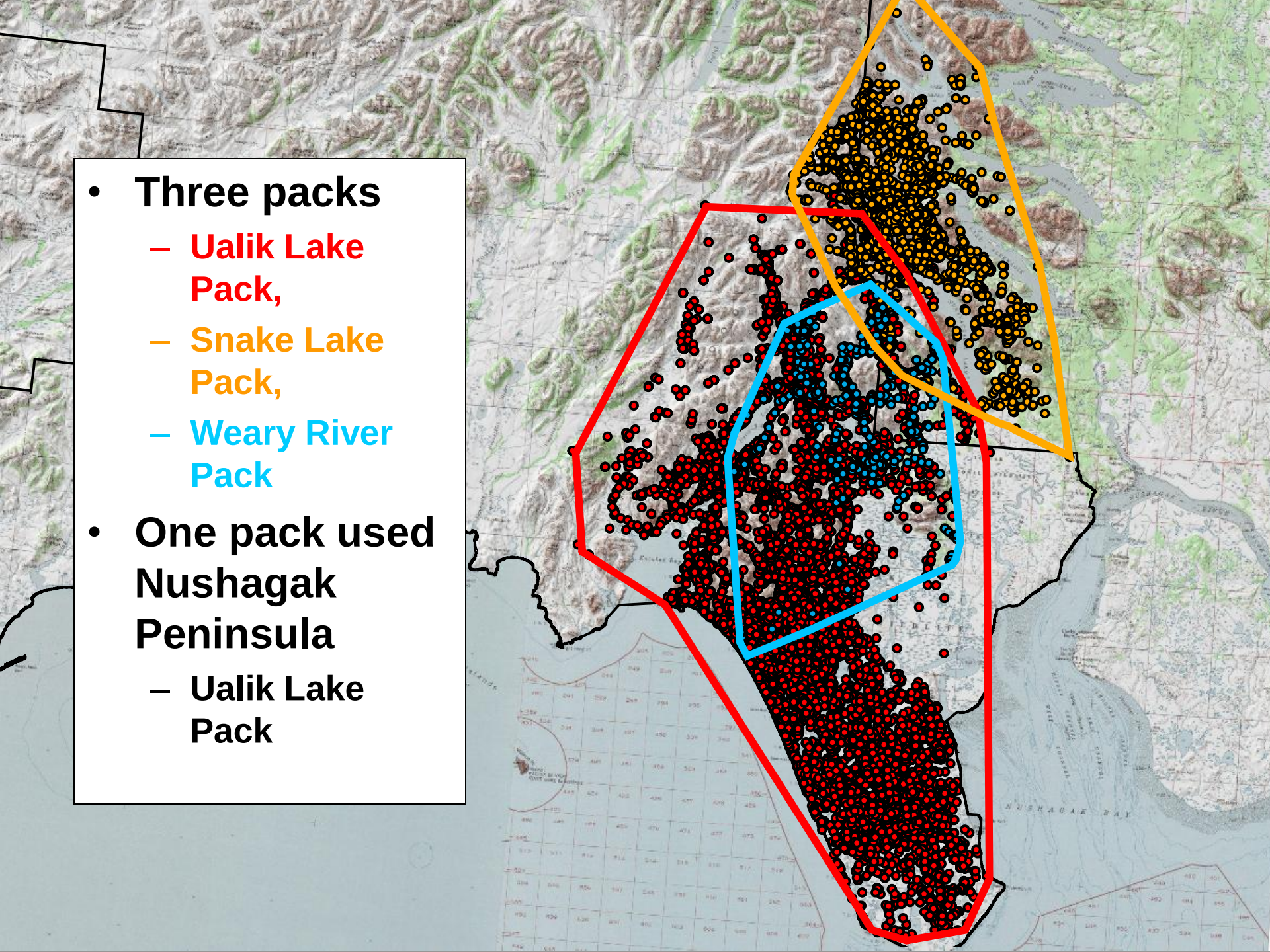
$$D_{wolf} = N_{wolf} * (P_{cw} * D)$$

Where N_{wolf} is number of wolves in packs using NP,
P_{cw} is proportion of time that collared members of these packs spent on NP,
D is number of days in season or year

Results

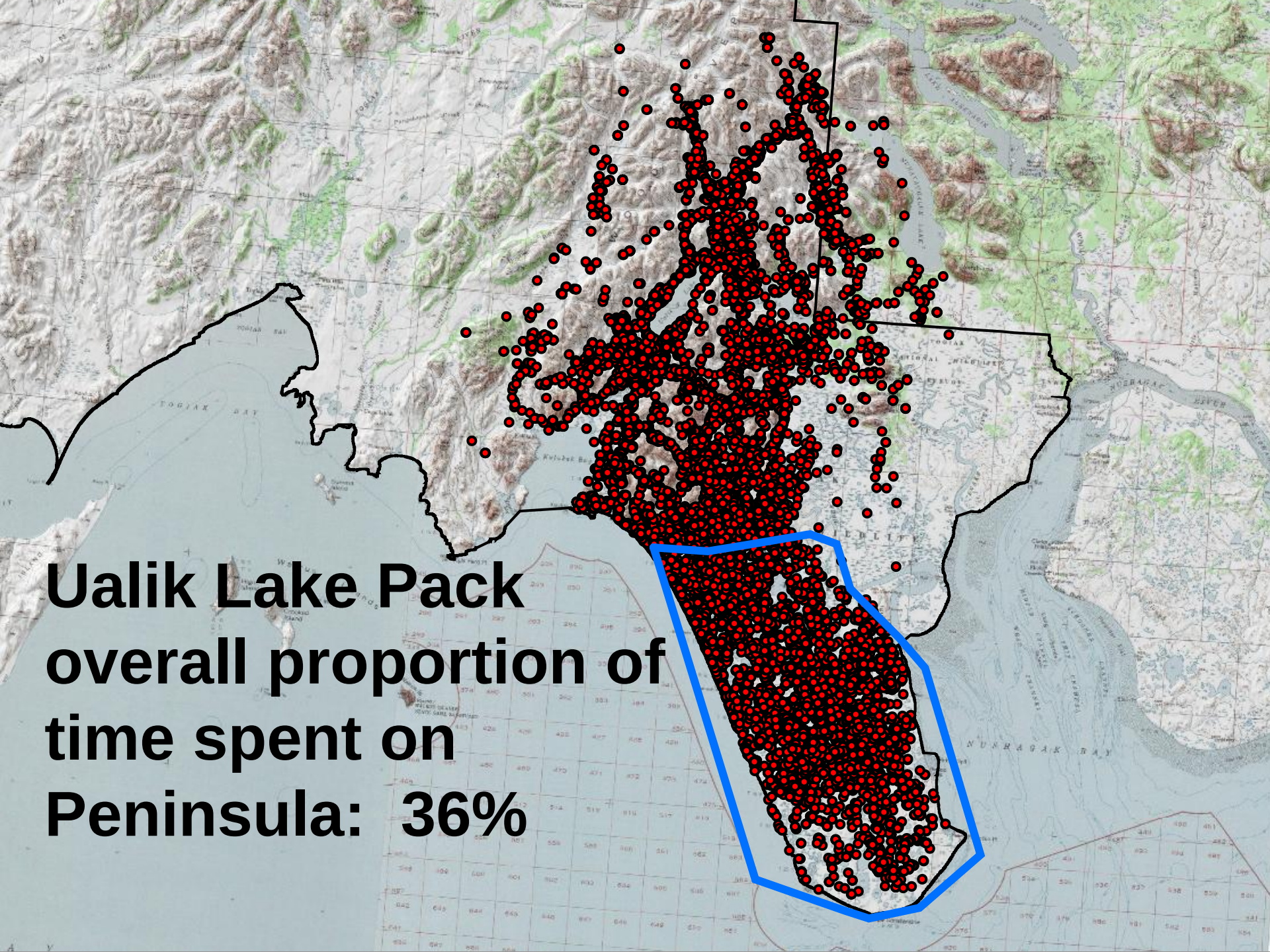
- 19 unique wolves
- 12 GPS collars on air from 80 to 1,286 days
- 9 GPS collars used Peninsula
  - Total of 4,326 days
- ~35,000 locations

- Three packs
  - Ualik Lake Pack,
  - Snake Lake Pack,
  - Weary River Pack
- One pack used Nushagak Peninsula
  - Ualik Lake Pack

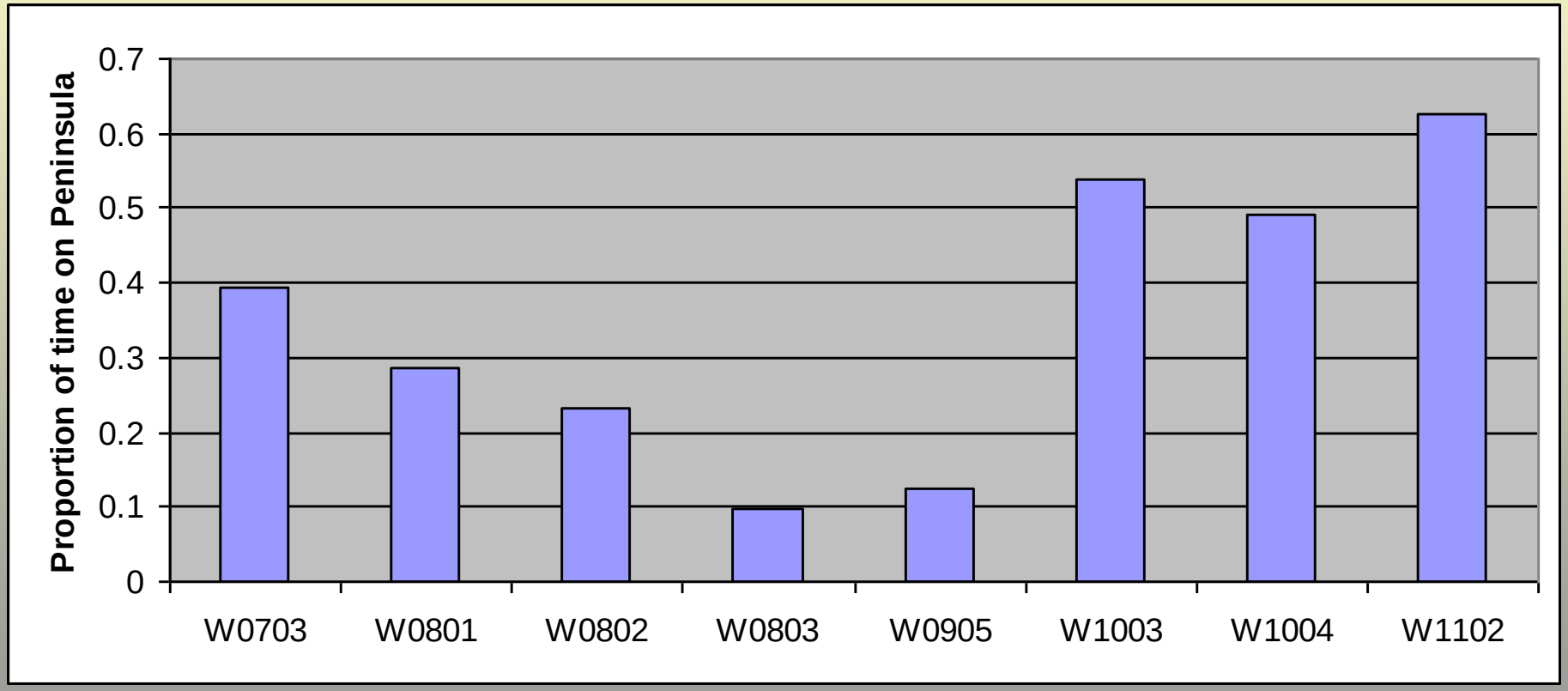


Pack size

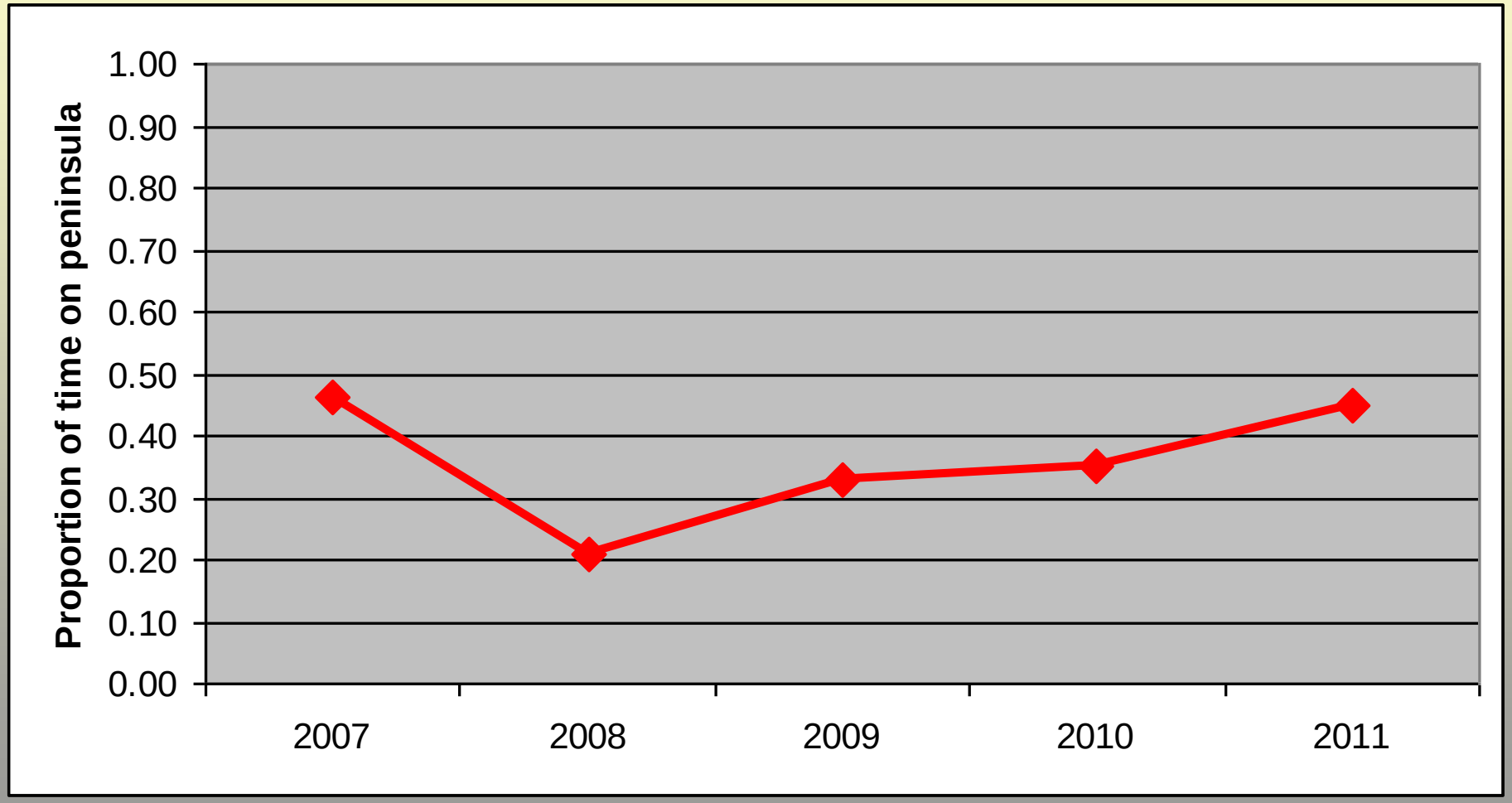
	Ualik Lake Pack	Snake Lake Pack	Weary River Pack
2007	5-10	1-2	
2008	10-15	1-2	2-6
2009	11-14	2-9	
2010	11-13	2-7	
2011	12-14	6-6	


Ualik Lake Pack
overall proportion of
time spent on
Peninsula: 36%

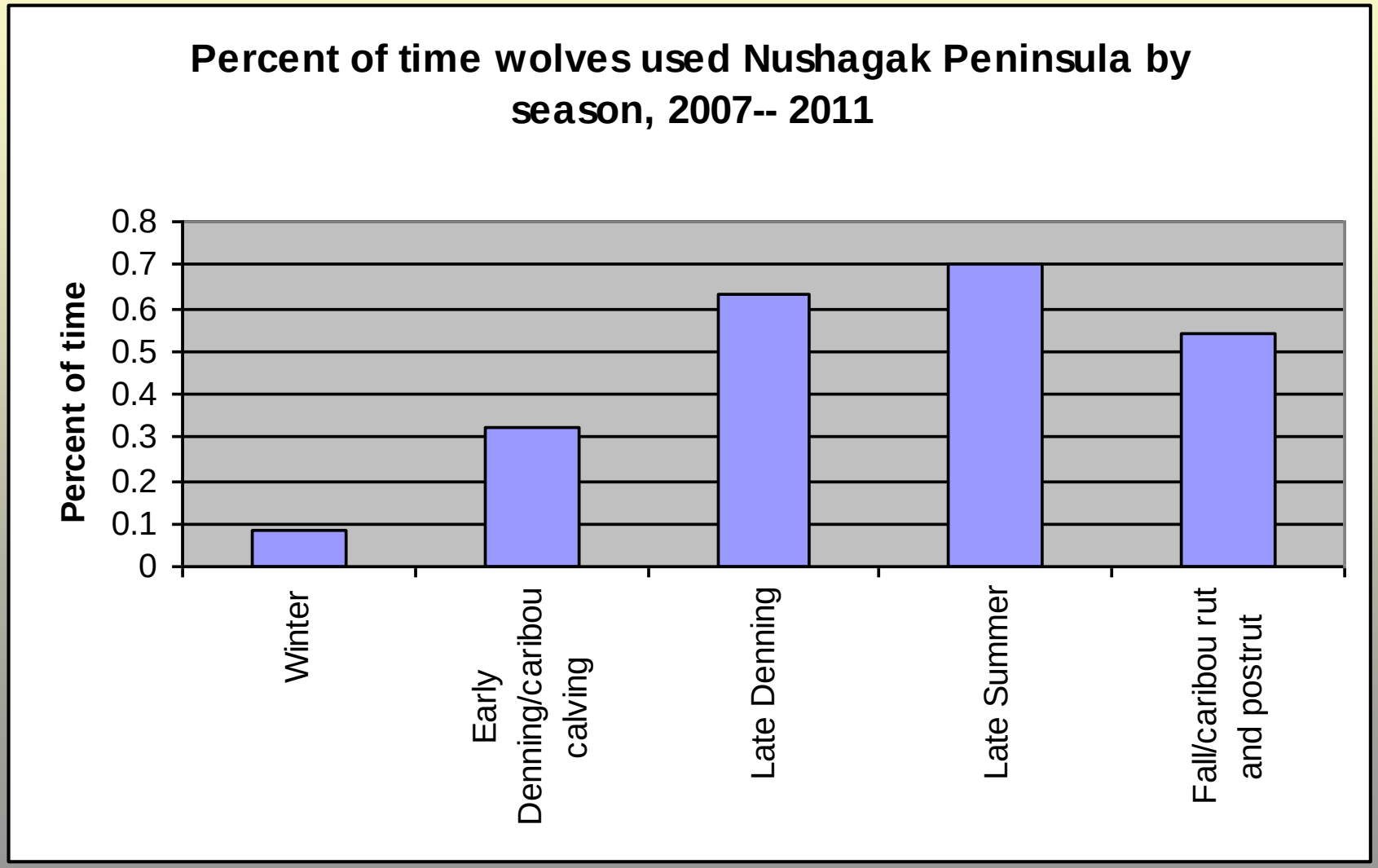
Variation in individual wolf use of Nushagak Peninsula, 2007-2011



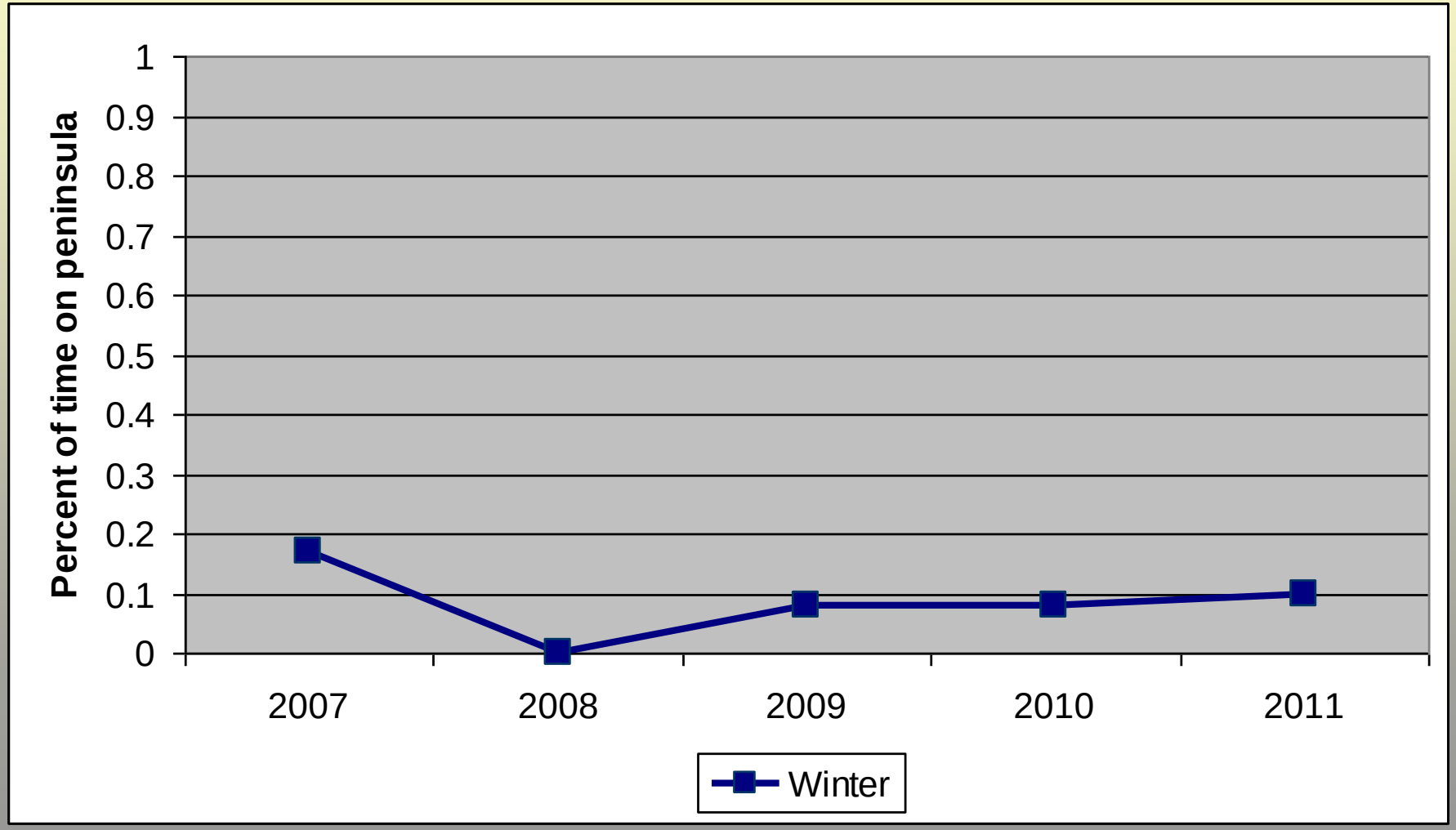
Annual time on peninsula



Overall seasonal use of Nushagak Peninsula



Trends in seasonal use of Nushagak Peninsula



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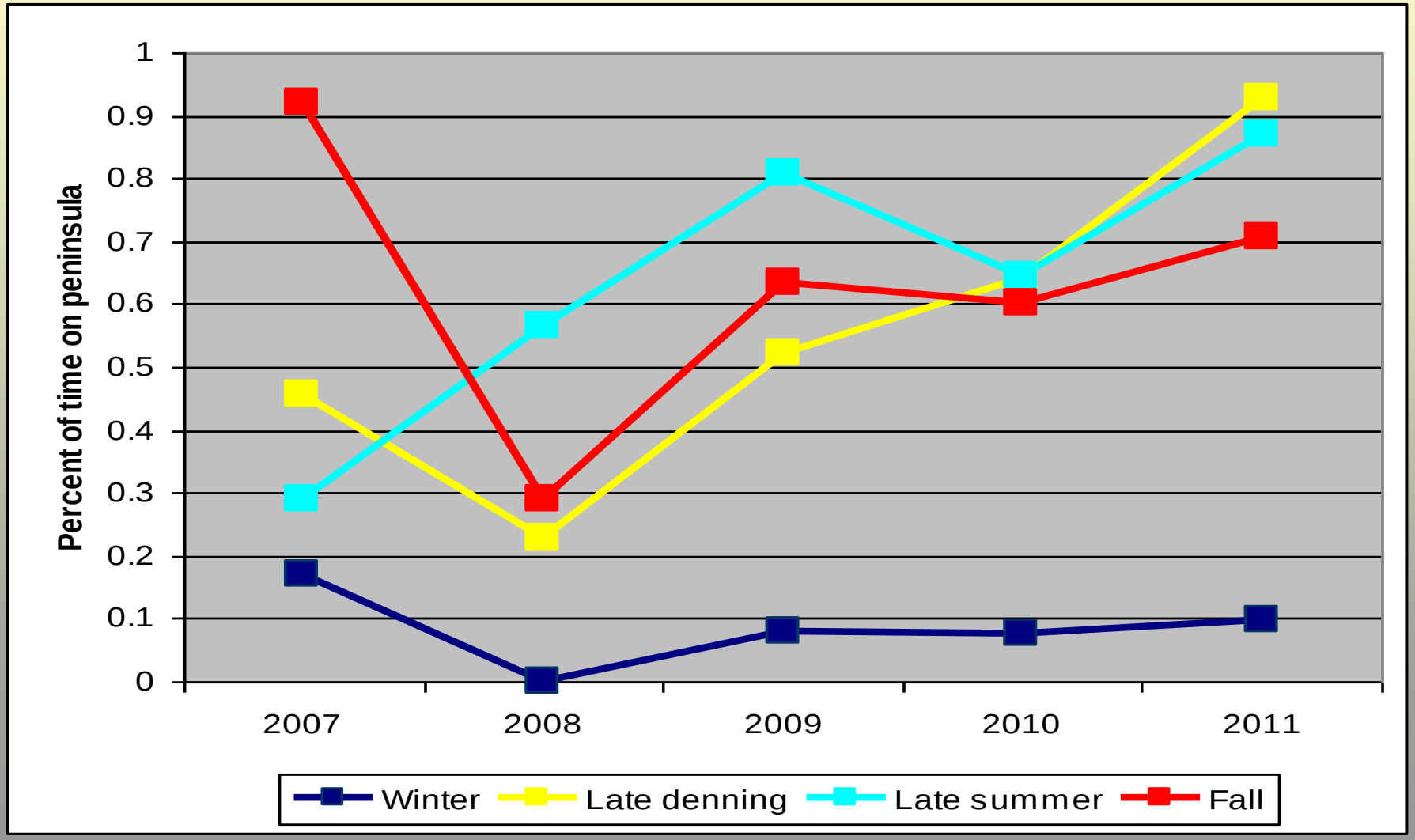

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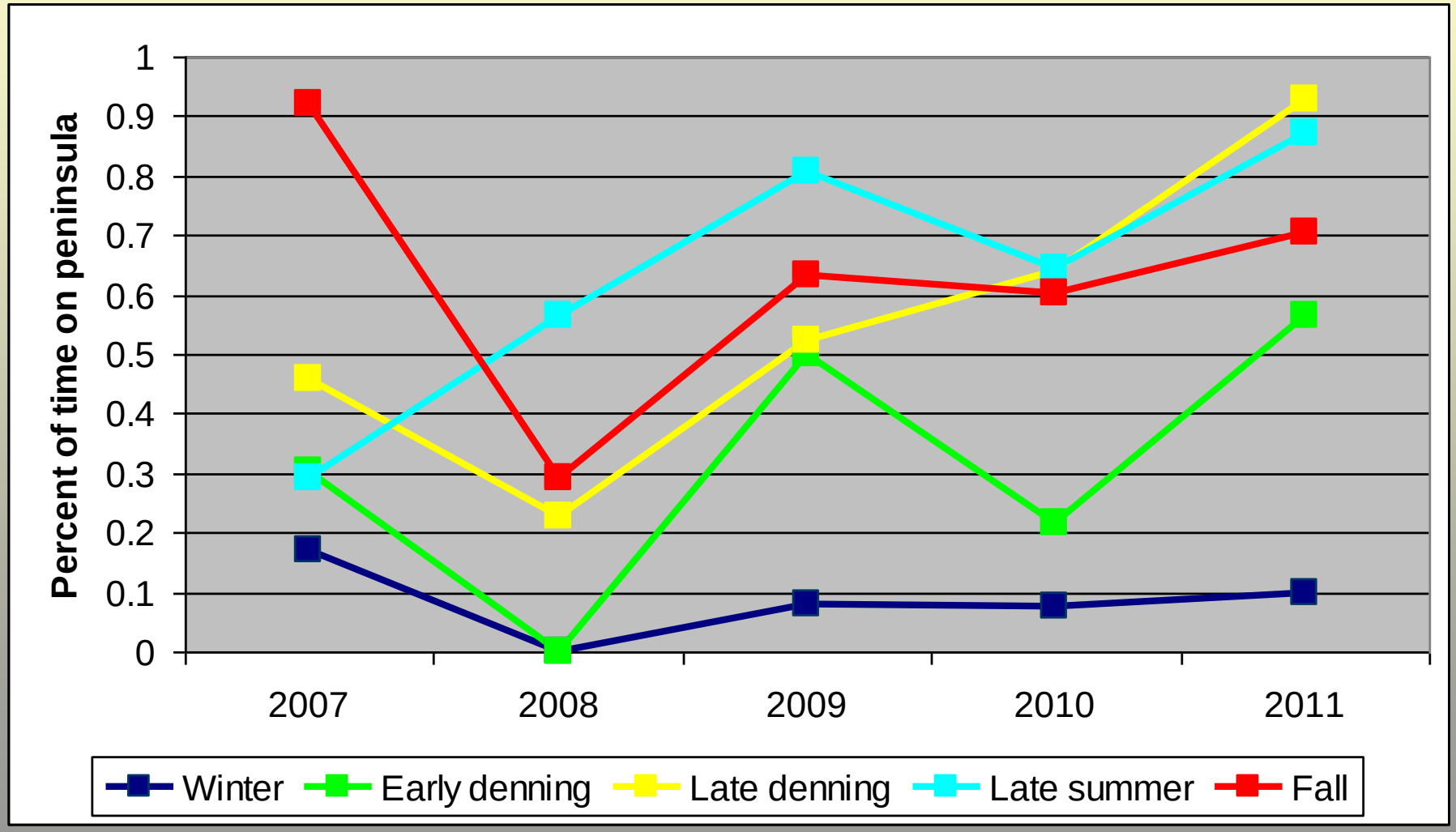
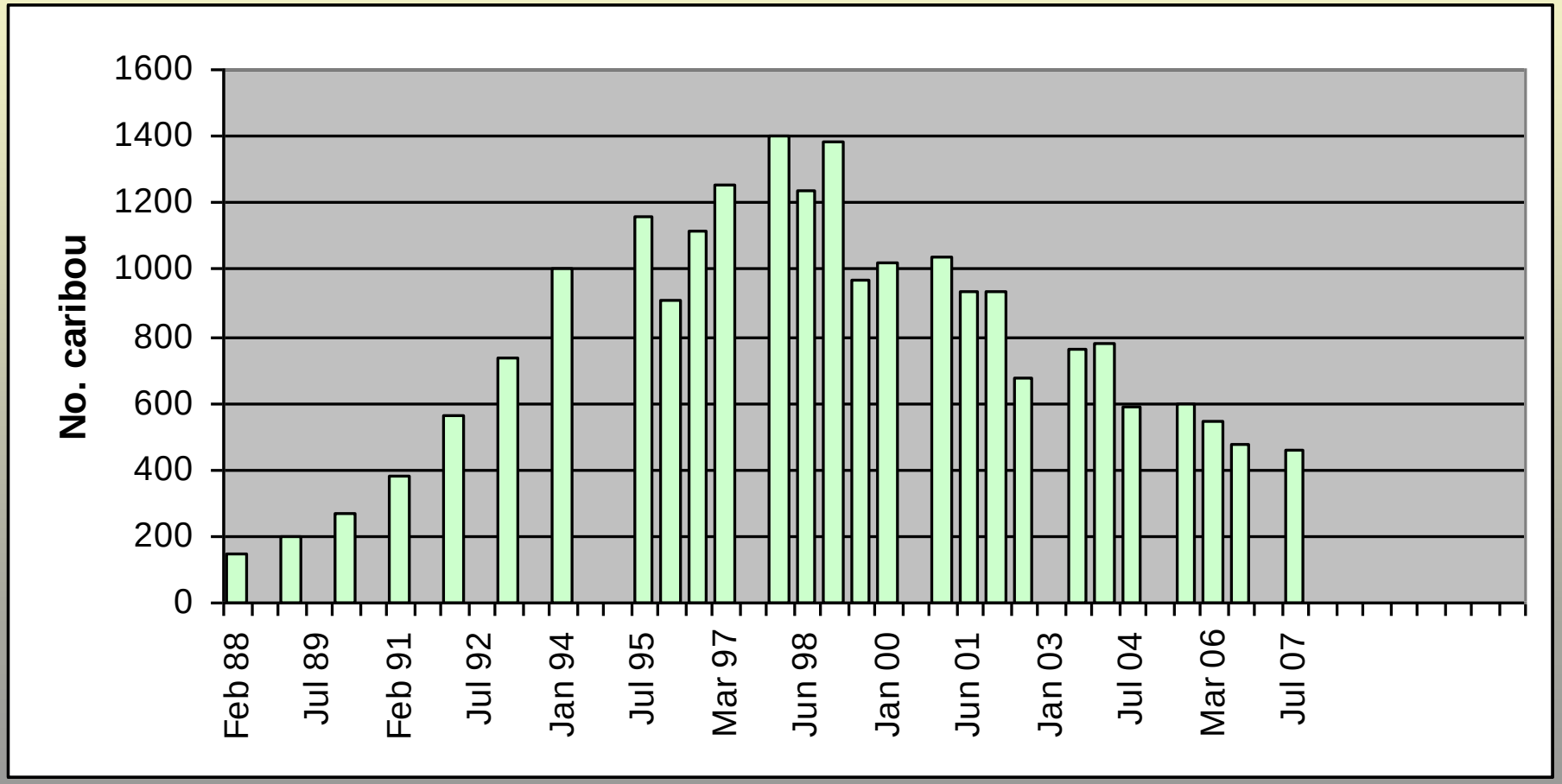
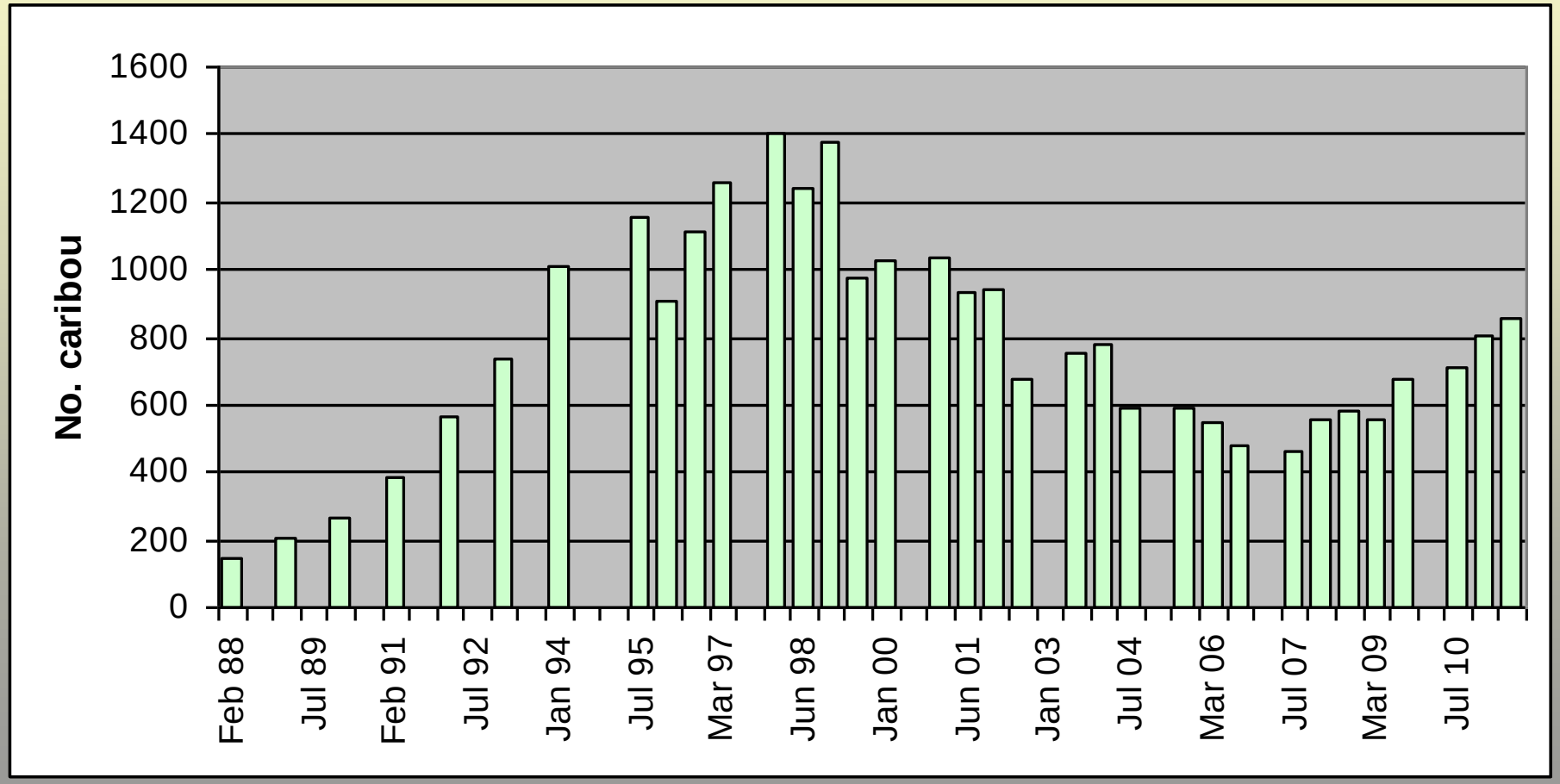


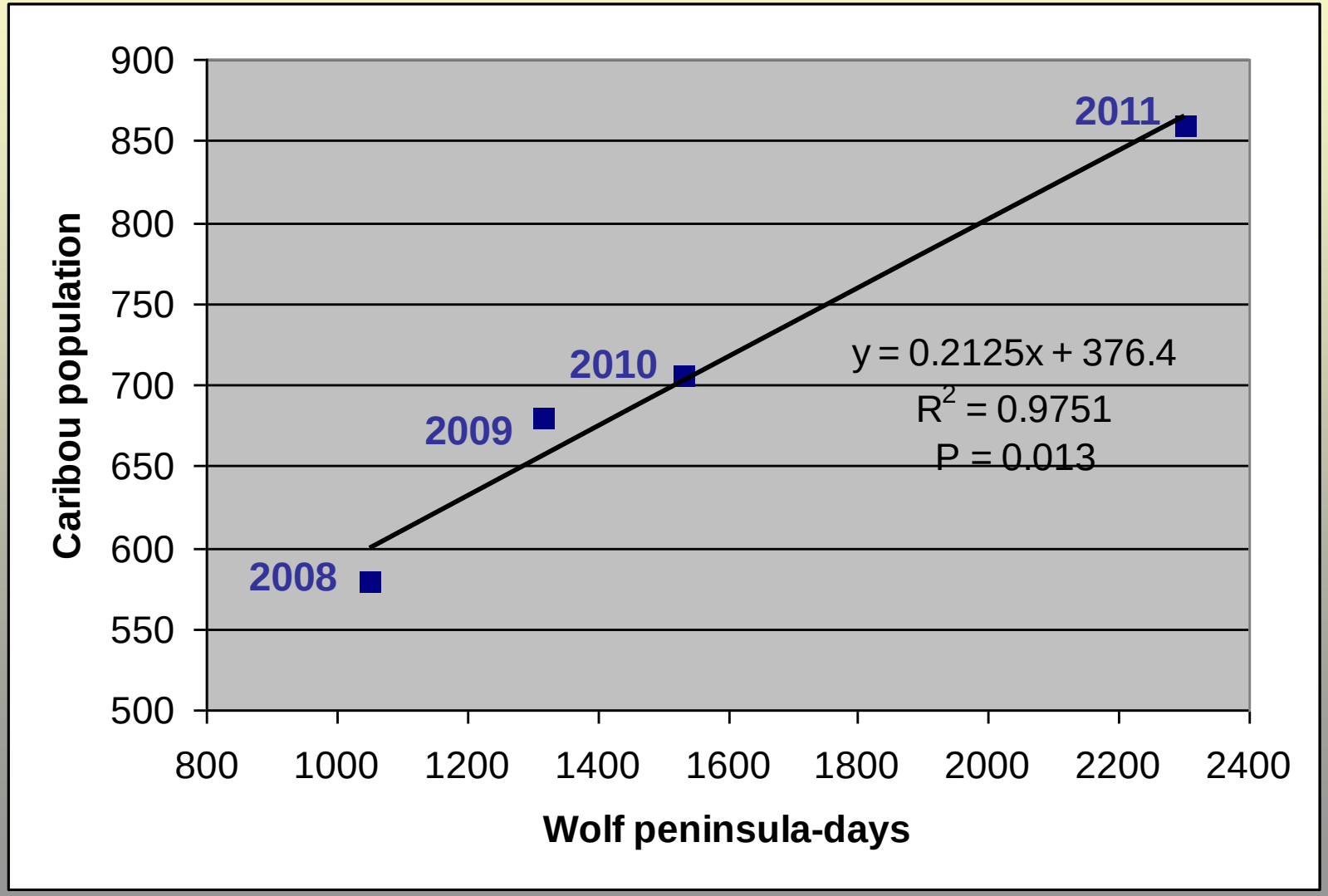
Nushagak Peninsula caribou population, 1988-2007



Nushagak Peninsula caribou population, 1988-2011

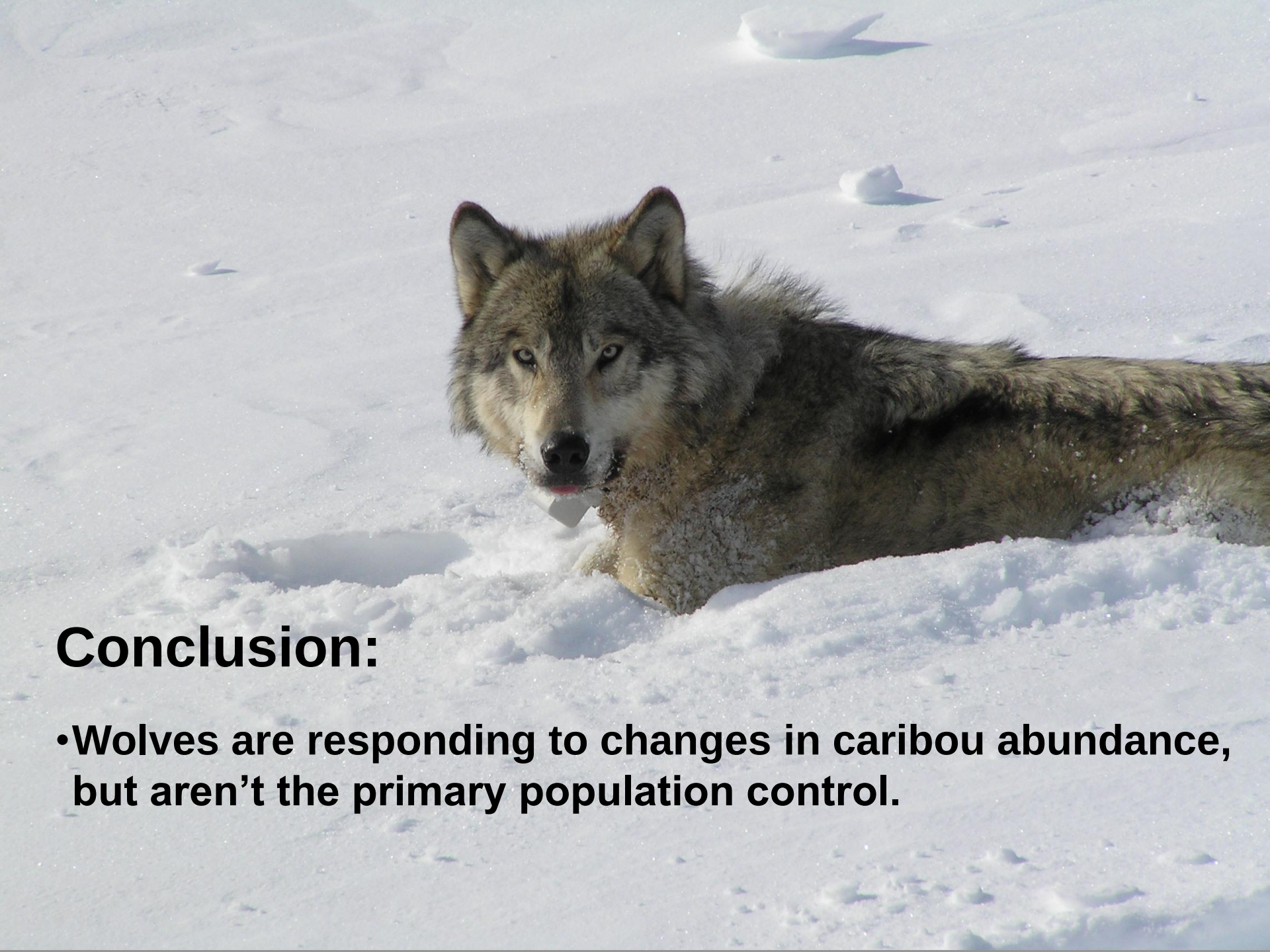


Relationship of caribou counts and wolf use of Nushagak Peninsula, 2008-2011



Summary:

- A single pack of wolves preyed on the NP caribou herd
- This pack has been relatively stable in size
- This pack spent most of its time (64%) focused on other prey
- It used the NP primarily in summer and fall
- This pack averaged 32% of its time on the NP during calving season
- Wolf use of the NP increased
- As wolf use of the NP increased, so too did the caribou population



Conclusion:

- Wolves are responding to changes in caribou abundance, but aren’t the primary population control.

Thanks

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