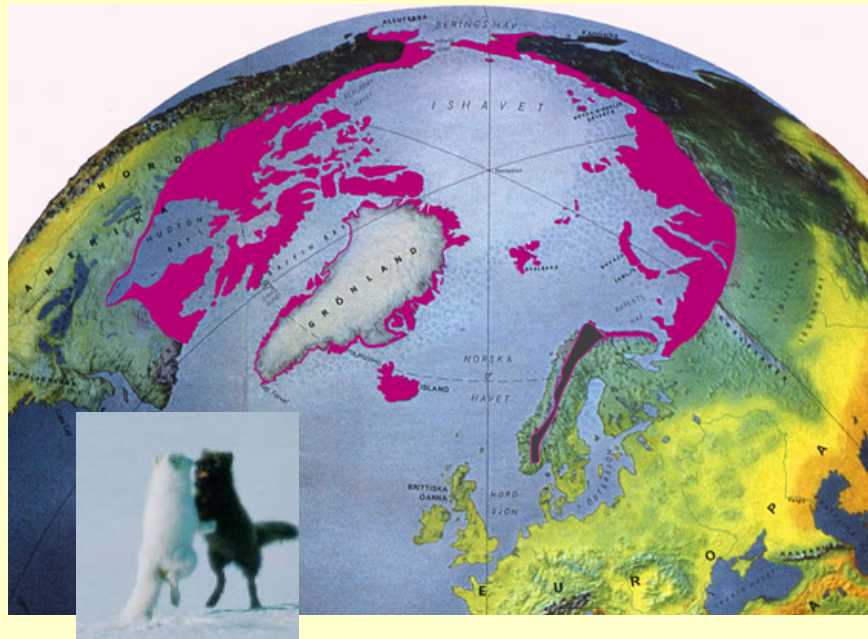
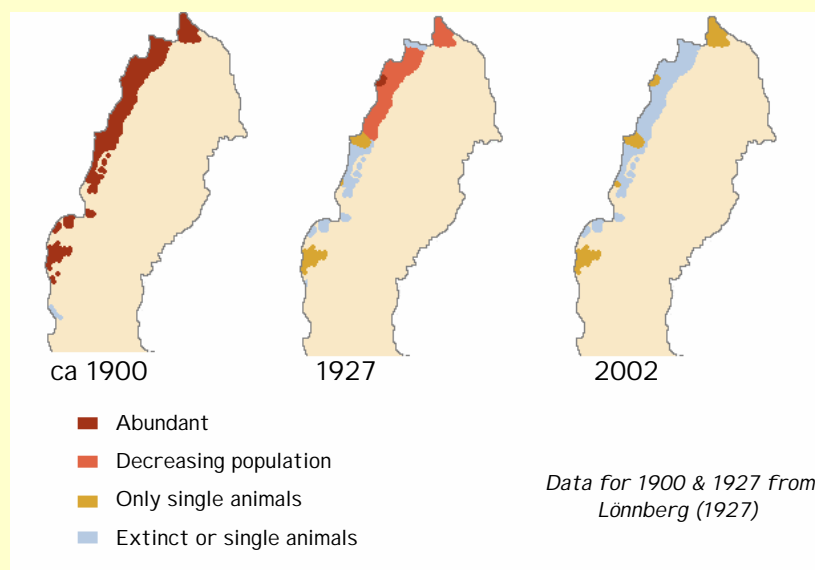
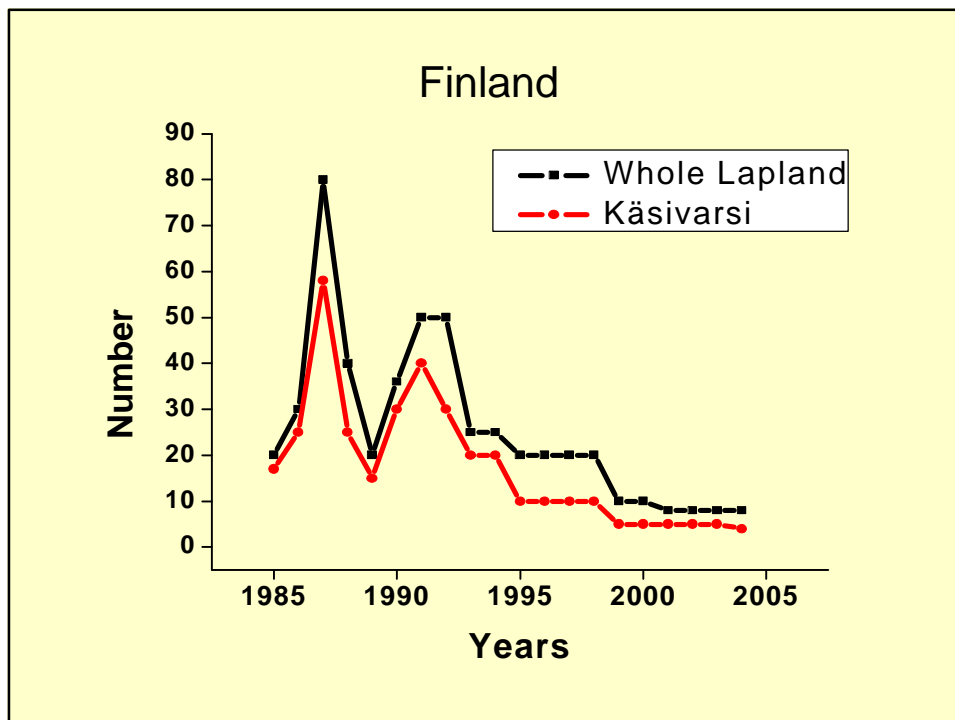
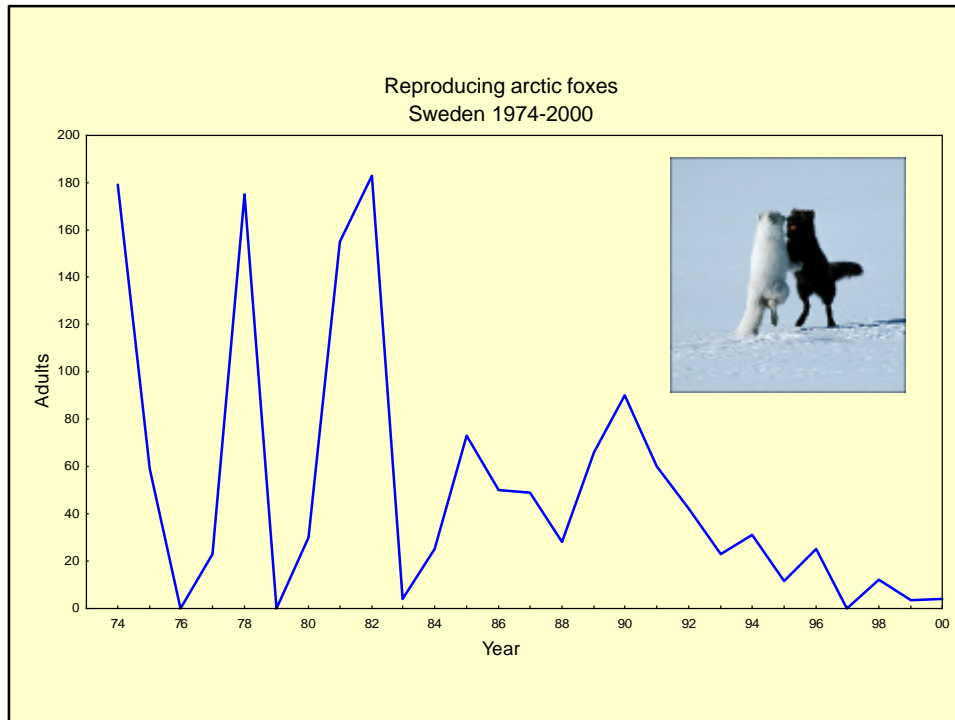


Arctic fox distribution



Arctic fox distribution in Sweden





The arctic fox in Fennoscandia 1998 vs 2004

No. of adults based on den surveys:

	1998	2004
Norway	30 - 48	30-50
Sweden	40 - 80	50-70
Finland	15 - 20	2-5

S = 80 - 125 individuals

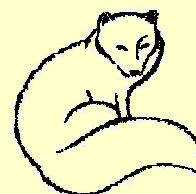
Ref: Frafjord & Rofstad 1998,
Angerbjörn et al 2002, Kaikusalo et al
2000, Dalén & Angerbjörn 2005,
Andersen et al 2005



SEFALO+ Saving the Endangered Fennoscandian *Alopex lagopus*



Stockholms universitet
Länsstyrelsen i Jämtlands län
Länsstyrelsen i Västerbottens län
Länsstyrelsen i Norrbottens län
Norsk Institutt for Naturforskning, NINA
Metsähallitus, Park and Forest Service
Metla, Finska Skogsforskningsinstitutet
Lantbruksuniversitetet, SLU Uppsala
Statens Veterinärmedicinska Anstalt, SVA



Naturvårdsverket
Finska Miljöministeriet
Direktoratet for Naturforvaltning
EU Life-Natur
Svenska WWF
Sametinget-Sámediggi
Prosjekt Fjellreven (NJFF, WWF Norge, NNV, DNT)

Fjällräven AB
Lapplandsafari AB
Fjällhästen
Ramundberget Alpina AB
Dogman AB

Threats to the arctic fox?



- Climate: yes
- Fragmentation: yes
- Food: rodents, carcasses, ptarmigans
- Competition/predation: red fox, other
- Inbreeding: low population size for 100 years
- Hybridization with farm foxes
- Parasites and diseases: unknown

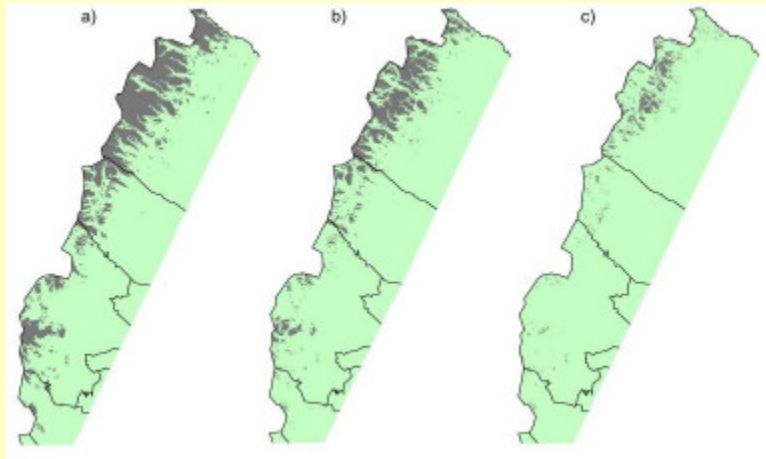
Threats to the arctic fox?



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- Fragmentation: yes
- Food: rodents, carcasses, ptarmigans
- Competition/predation: red fox, other
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Klimatförändringar

a) nuvarande b) 100 m c) om 100 år enligt klimatmodell



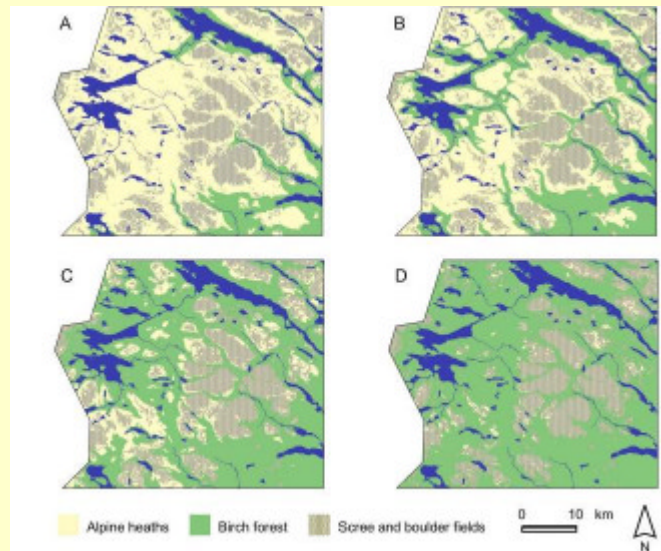
Threats to the arctic fox?



- Climate: yes
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Situation in Sarek-Padjelanta

a) now b) 100 m c) in 100 yrs d) in 100 yrs



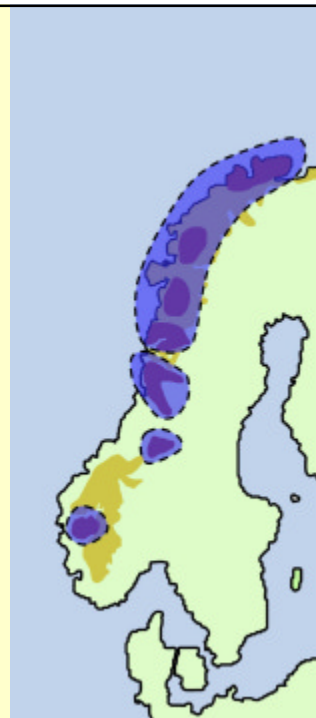
Substructure based on Genetic data

1. Four populations:

- *Hardangervidda* 10
- *Helags* 40
- *Børgefjell – Borgafjäll* 40
- *Vindelfjällen-Finnmark* 40

2. No connection with Kola

3. No migration between populations

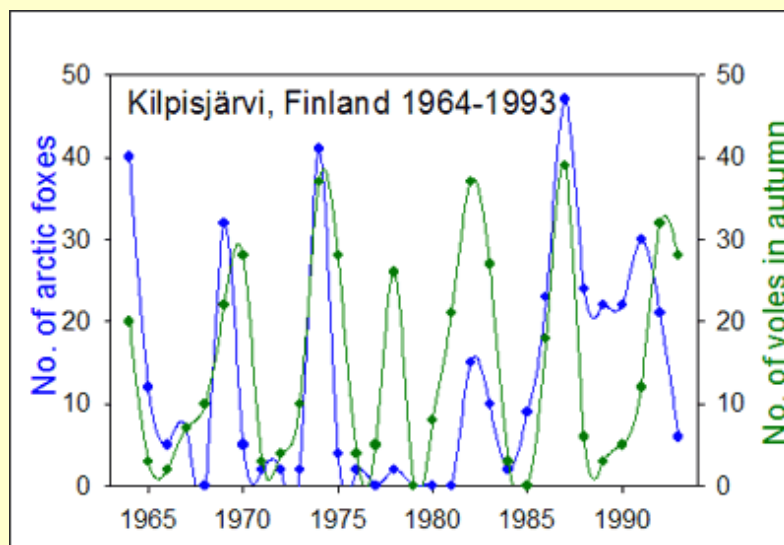


Threats to the arctic fox?

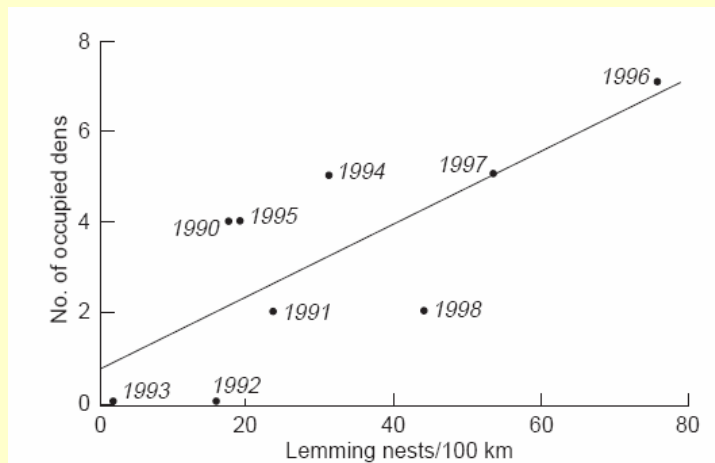


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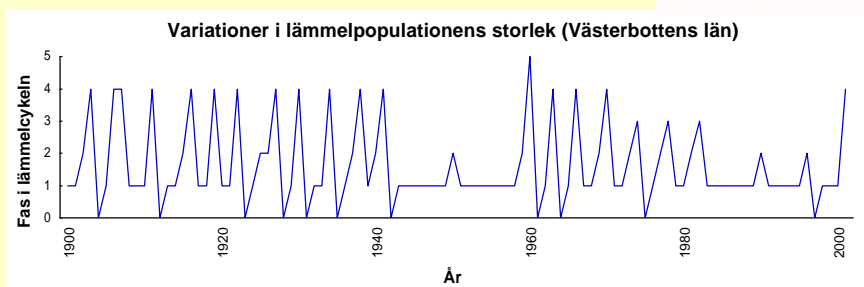
Cyclic fluctuations



Numeric relation between arctic fox and lemmings in Vindelfjällen



Lemming abundance in Västerbotten - qualitative data



Winter feeding gives more occupied dens

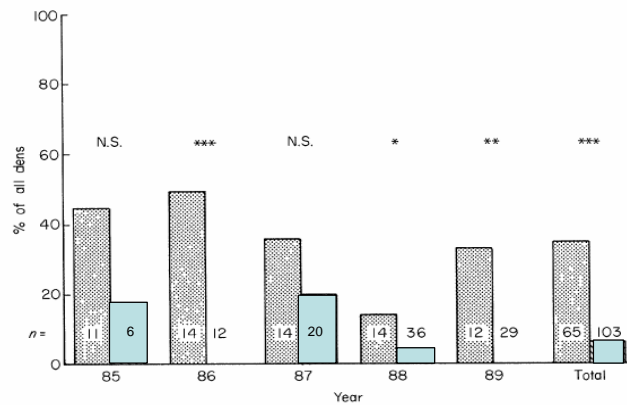
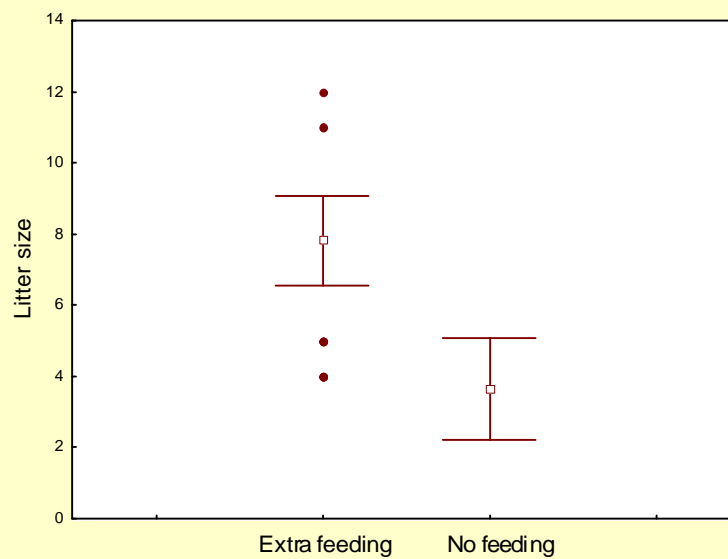
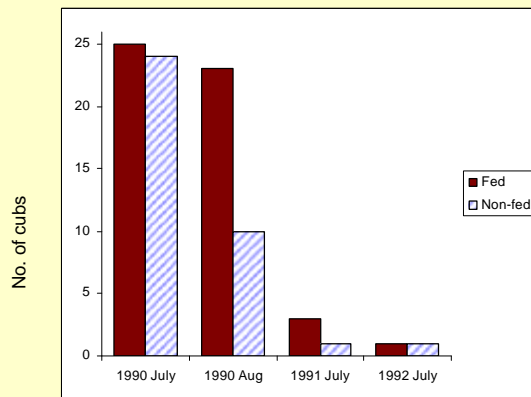


FIG. 3. Proportion of occupied dens (% of total) in relation to the feeding experiment food (\square); control (\blacksquare). * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, N.S. not significant in a G -test.

Winter feeding gives larger litters



Summer feeding gives higher cub survival



Threats to the arctic fox?



- Climate: yes
- Fragmentation: yes
- Food: rodents, carcasses, ptarmigans
- *Competition/predation: red fox, other*
- Inbreeding: low population size for 100 years
- Hybridization with farm foxes
- Parasites and diseases: unknown

Unfriendly relatives

Competition and predation

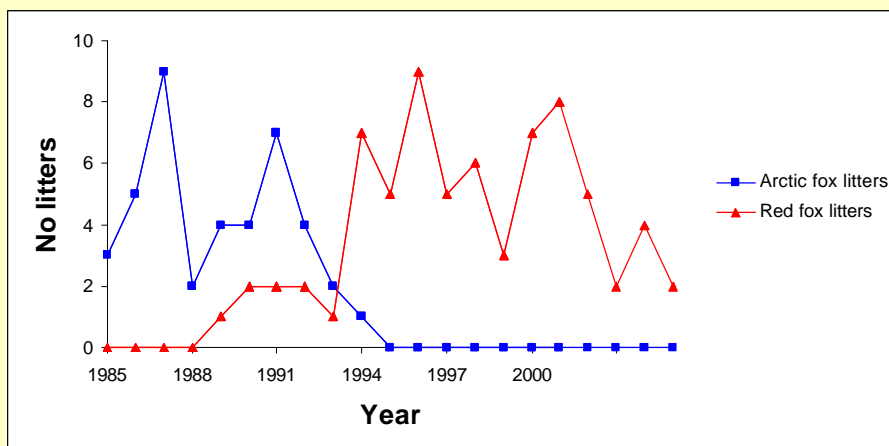


Arctic fox



Red fox

Arctic and red foxes in NW Finland



Only known (?) pictures of a red fox killing an arctic fox



From Pamperin et al. (2006), *Arctic* 59:361-364

Spatial separation between dens?

Arctic fox

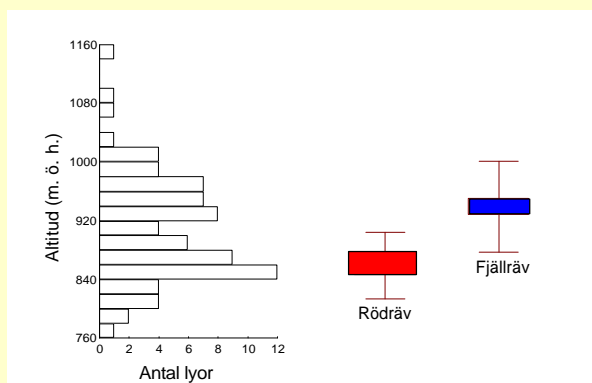
4.5 km from tree line

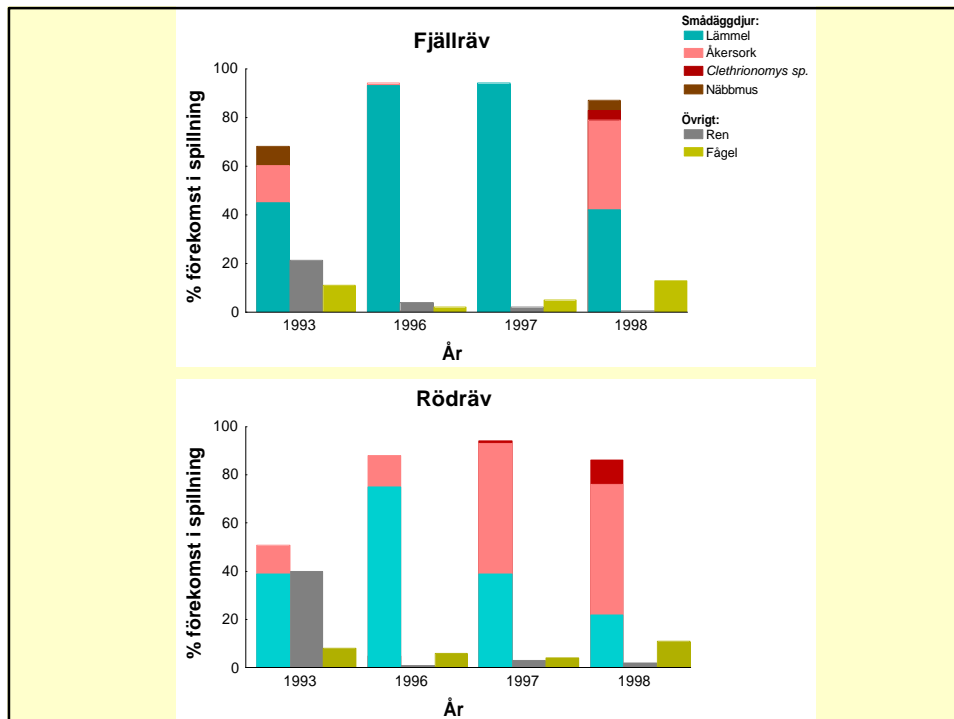
940 m

Red fox

2.7 km from tree line

860 m





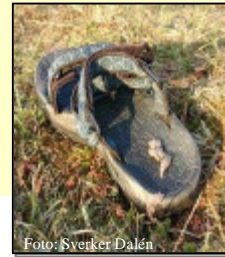
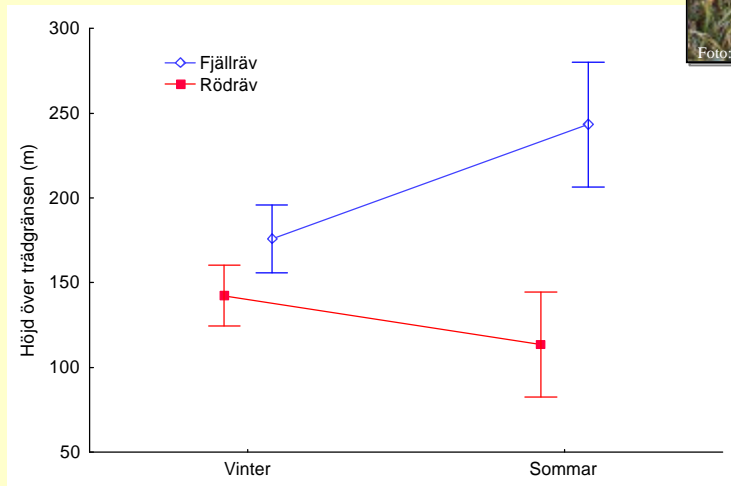
Arctic fox & red fox

- Same fundamental food niche, although red fox can switch to alternative prey and utilizes birds to a higher extent
- Same habitat preferences
- The red fox is the dominant species...
- ...and depredates arctic fox pups
- Arctic foxes reproduce at higher altitudes



When is the competition important?

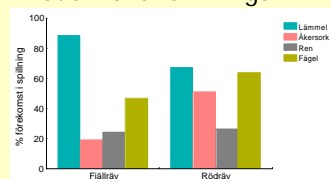
DNA from faeces



The same food niche for arctic and red foxes?

At higher altitudes:

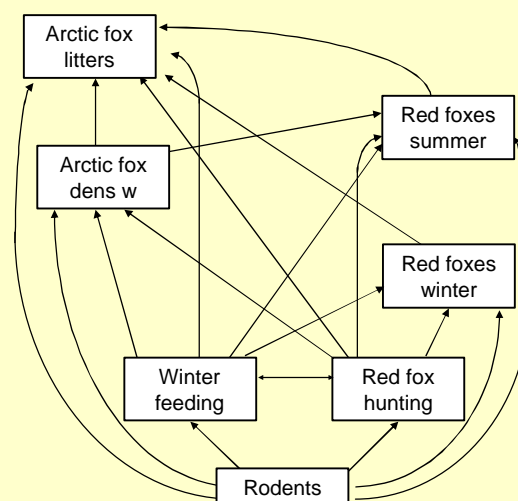
- lower productivity
- less birds
- less voles
- but more lemmings



Effects of red fox hunting and extra winter feeding – large scale

- Eight areas all over Sweden
- About 300 dens inventoried yearly
- Number of dens with arctic foxes
- Number of dens with red foxes
- Between 20-100 red foxes shot each year
- Number of dens supplied with extra food
- Rodent cyclic phase: low or high

Arctic fox vs red fox hunting and winter feeding



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Is Fennoscandia isolated?

