



Evaluation of the use of expert models in game management

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Managing game

What do we need to know?

- Conservation and management of wildlife populations requires information on the population status
 - Population data(density, recritment, mortality)
 - Hunting data (bag, effort)

When do we need to know?

- Population data preferably before the hunting
 - able to adjust the outtake
- Usually some info after the hunting season

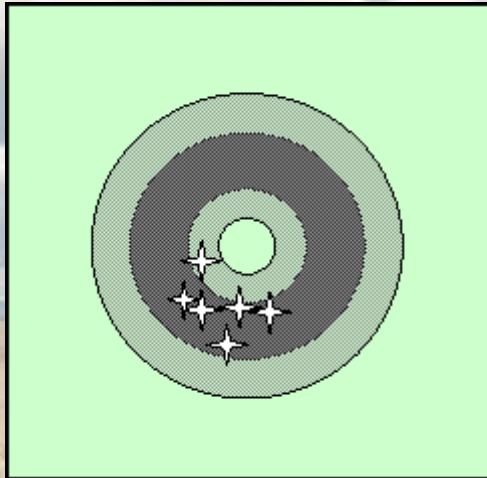
How good estimates do we need?

- Depends on the question....
 - We might want to keep a moose population within 5.5 – 6.5 moose/1000ha
 - We might want to ensure sustainable hunting of capercaillie. The population must not fall below a certain threshold level.

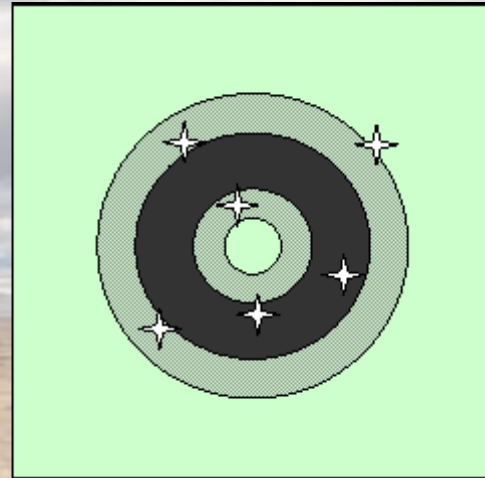
What is a good estimate?

- Only a number does not tell the whole story!

Bias and precision



Bias; Systematic overestimation or underestimation of the actual value



Level of consistency

Monitoring in Scandinavia today

- The landowner (or the one leasing the land) have to ensure sustainable hunting

Monitoring in Scandinavia

- Economically important species
 - Moose; national and regional monitoring and obligatory bag statistics
 - License on number of moose per area
- Small game
 - By tradition assumed local hunting do not affect populations negatively
 - Usually very low hunting pressure over large areas
 - Bag statistics sometimes collected

Monitoring in Scandinavia

- Hunting entrepreneurs
 - Biologically same rules as local hunters
 - Can be assumed a higher outtake per area
 - Social sustainability
 - Important with transparency, to show sustainable hunting (no problem with moose)
 - Practical reason and PR
 - Inform the guests
 - Adjust hunting pressure, maybe suggest rebooking?

Available monitoring methods

- Scientific quality ensured methods
 - Expensive and time consuming
 - Distance sampling
 - Capture-recapture methods

Aim of the study

- This study evaluates the use of expert models as an alternative to existing methods. We evaluated how expert judgments of game density and population changes related to population estimates based on established scientific methods

Methods

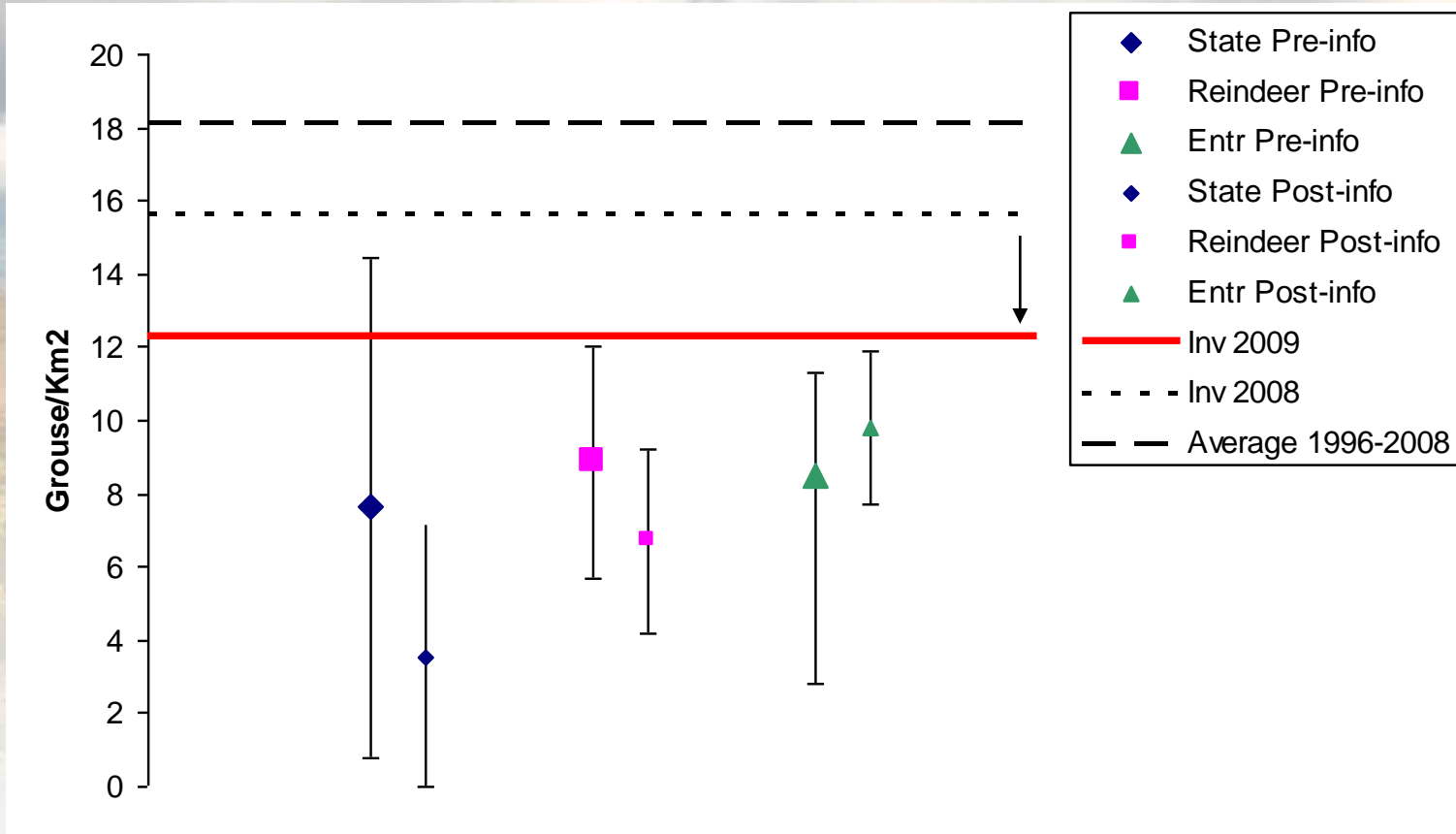
- Expert models are judgments (in this case of of game density and/or development) by people having a special interest and/or competence in the targeted populations
- Usually by spending a lot of time in the area during summer

Methods

- Two species
 - willow ptarmigan (*Lagopus lagopus*) which exhibits large annual fluctuations (two common land areas; north and south)
 - moose (*Alces alces*) which shows more stable population dynamics (one “common” land area)
- Three expert groups for each species
 - For willow ptarmigan; hunting entrepreneurs, reindeer herders and government caretakers of the mountain range
 - For moose; Hunters, personnel from forest companies and transport employees

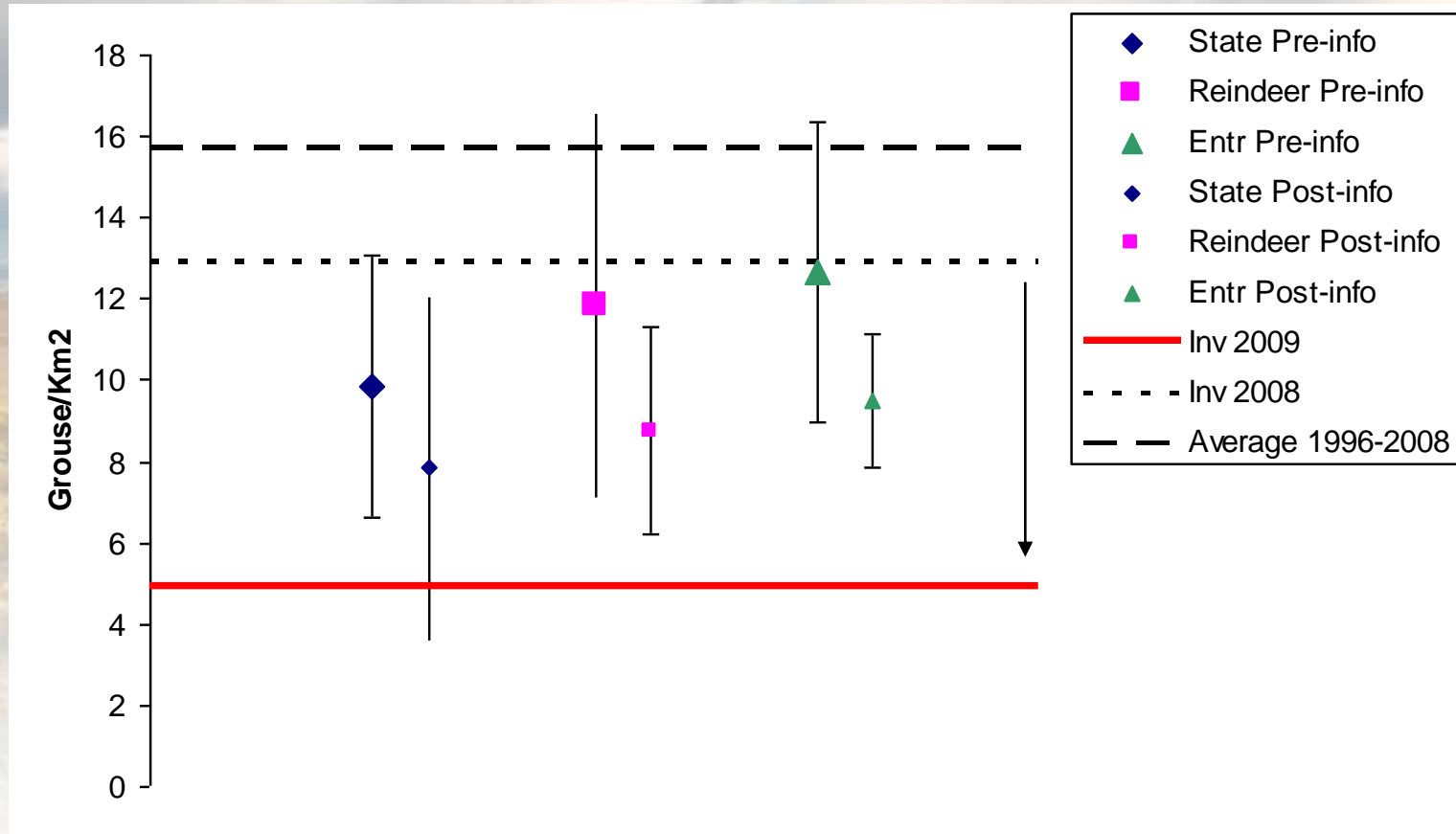
Results

Willow Ptarmigan North Absolute density



Results

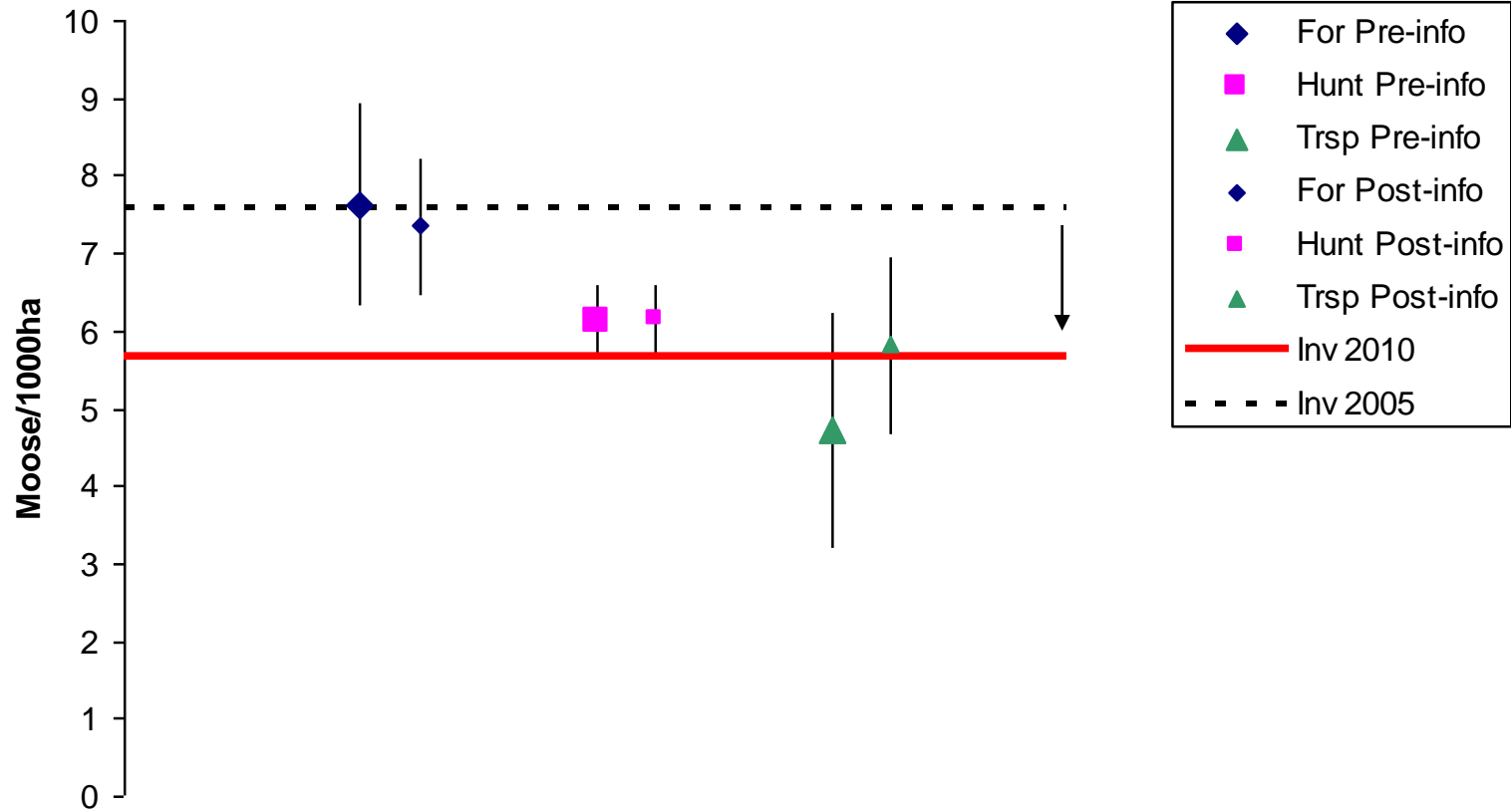
Willow Ptarmigan South Absolute density



Results

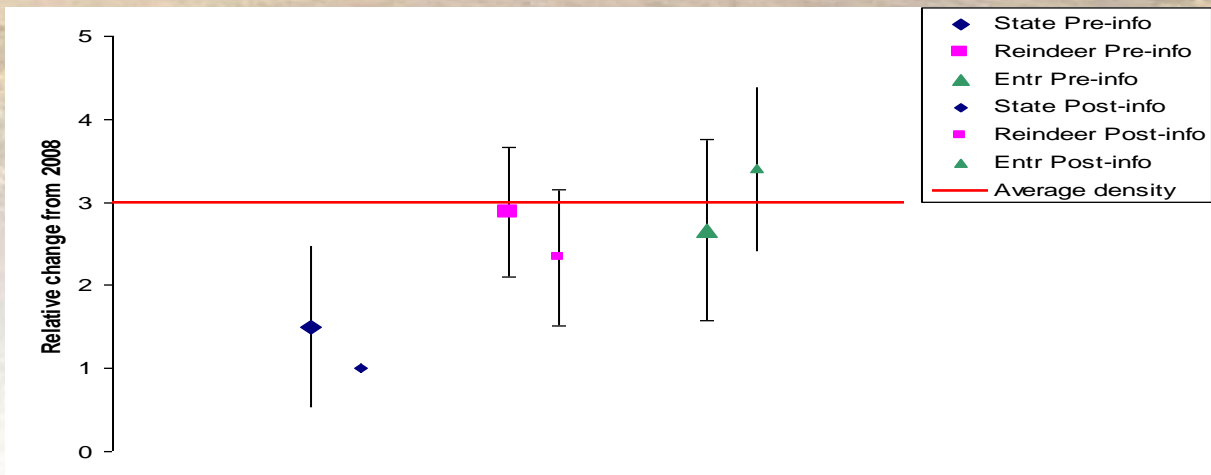
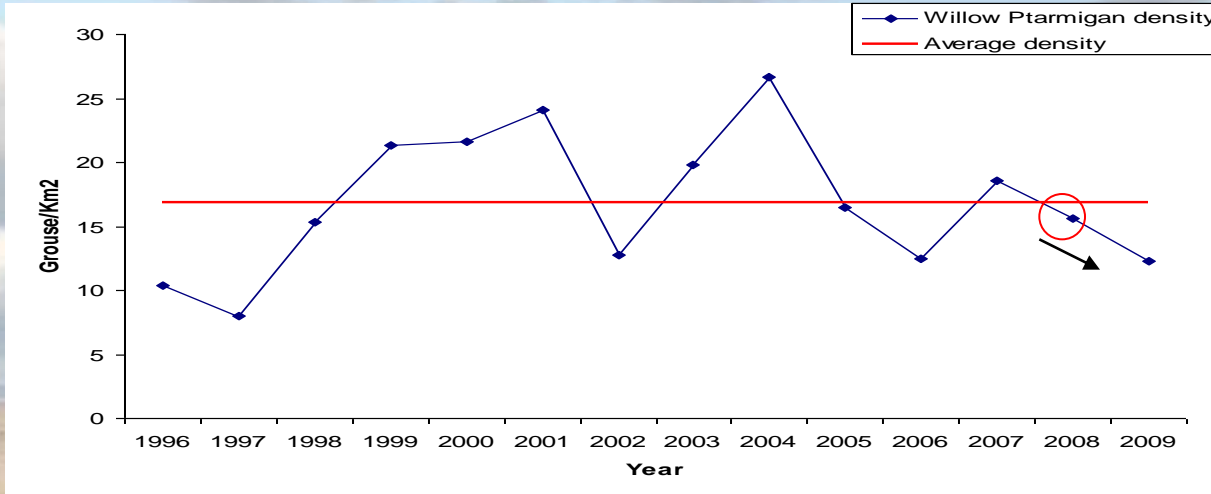
Moose

Absolute density



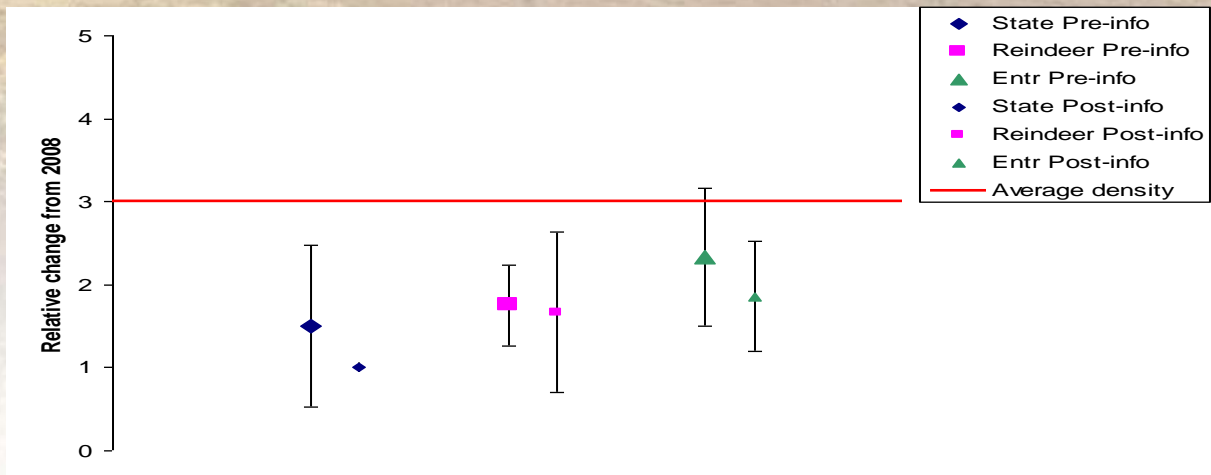
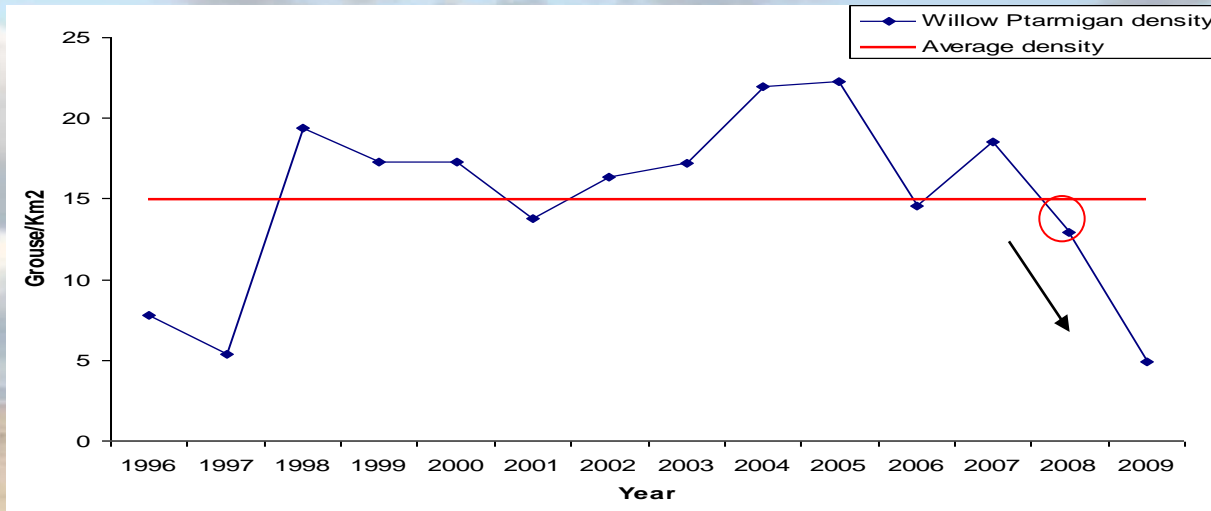
Results

Willow Ptarmigan North Relative density



Results

Willow Ptarmigan South Relative density



Discussion

- Want to have high precision and small bias
- Absolute grouse estimates had low precision and large bias
- Absolute moose estimates better than grouse estimates; high precision and low bias for two groups
- Large V.S. small population fluctuations
- May be improved by experience?
- “private” areas may give better estimates?

Discussion

- Relative estimates indicate better prospects
- A lower threshold level may be enough to ensure biological and social sustainability (depends on the goal)
- Individual models, adjusted by experience
 - Combined with bag statistics and measures of effort

Thank You!

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