Hunting effort and population densities as determinants of grouse bag size

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Study area

- Jämtland County in Sweden
- 88 management areas
- 4 experimental areas

Figure 1. Map of Jämtland County where willow grouse management areas are grey and experimental areas are black.
Materials and methods

- 1996-2007
- The number of grouse was counted before the hunting season
- Willow grouse was seen 157-422 times annually
- Breeding success was estimated by the number of chicks
• Two of the first years only Swedish hunters
• Bag records from experimental areas
• Max 8 grouse per day
• Harvest rate was controlled
• CPUE (catch per unit effort)
Results

- The experimental areas differed in bag size and hunting effort
- Hunting effort had a large effect on bag size
- Hunting effort explains 48% of variation in bag size
Grouse density had a smaller effect on bag size than hunting effort.
• The hunting effort was lower in 1996-1998
• Only Swedish hunters
Discussion

- Bag size was more affected by hunting effort
- Twice as big effect as grouse density
- Population density had almost no effect
• Difficult to sustain a stable hunting effort

• When hunting effort is low bad conditions affect it greatly

• Population density might have had a higher effect on bag size
  if bad hunters were excluded in the study

• A threshold could be set for hunting effort which would have to be exceeded
  ➔ Bag size could indicate population density
Low grouse density leads to higher hunting effort

Hunting effort is higher in areas with a lot of grouse brood observations

Harvest statistics are a better way of avoiding over-harvesting than hunting effort
References

- Willebrand, T., Hörnell-Willebrand, M. & Asmyhr, L., 2011, Willow grouse bag size is more sensitive to variation in hunter effort than to variation in willow grouse density, *Oikos 120*: 1667-1673

Pictures:
- http://birdnote.org/show/silly-willow-ptarmigan
- http://sebastiaanvandergreef.nl/portfolio/finland/
Thank you!