

Tick control strategies for the management of louping ill virus in red grouse.

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**NATURAL
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Dr Lucy Gilbert



research today for land use tomorrow

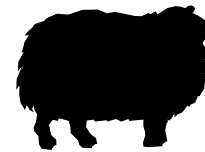
Talk Outline

- Background
- Tick control strategies
- Model Predictions
- Future plans

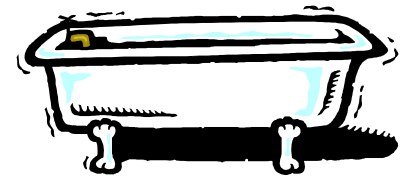
Louping Ill Virus (LIV)

- Tick borne disease 

- Affects sheep and grouse

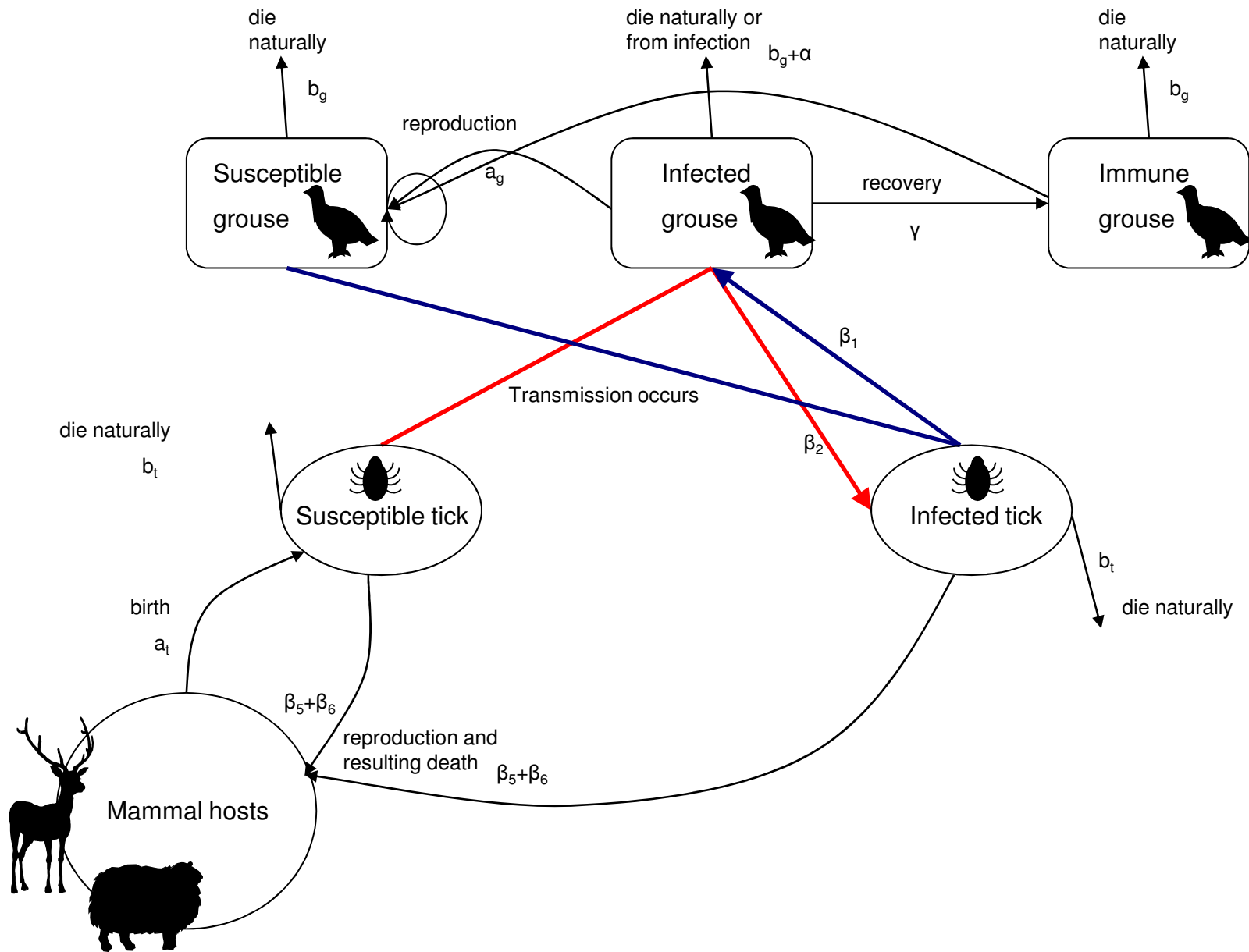


- Sheep vaccinated and 'dipped'



- 80% mortality in infected grouse





Sheep 'tick mops'



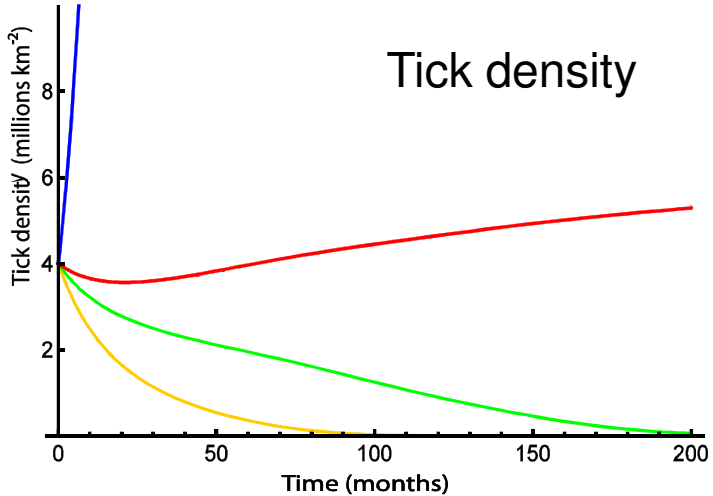
- Actively use sheep treated with acaricide to 'mop up' ticks.



What does the model predict when adding 50 treated sheep per km² to areas with different deer densities?

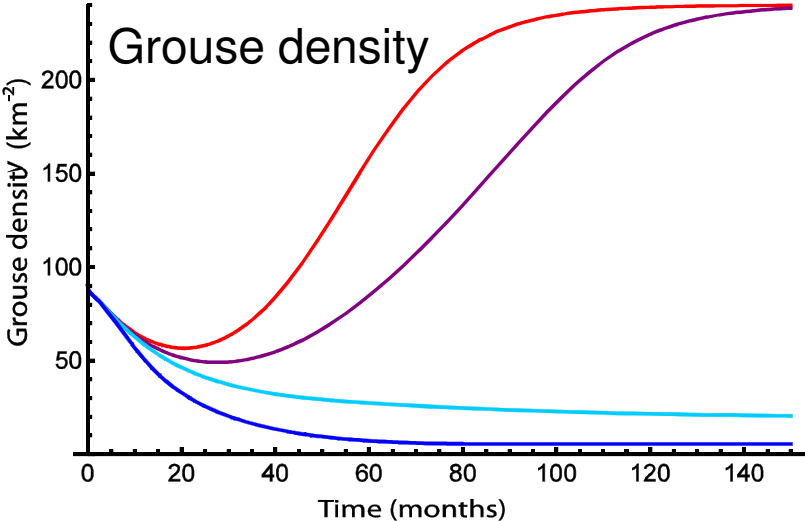
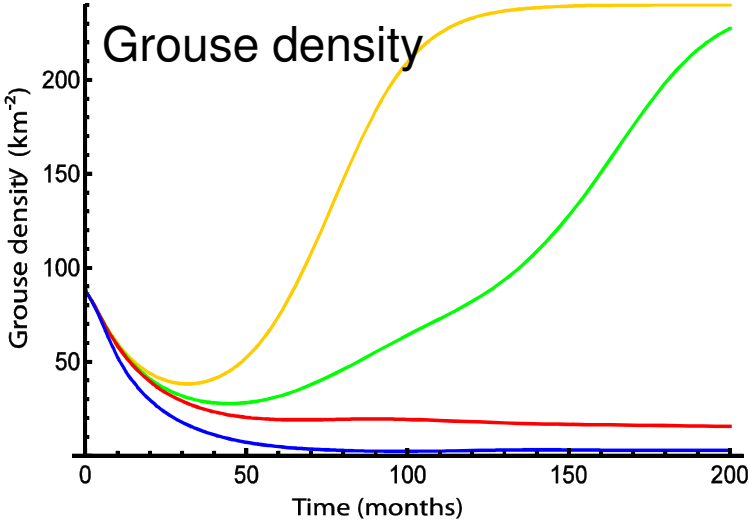
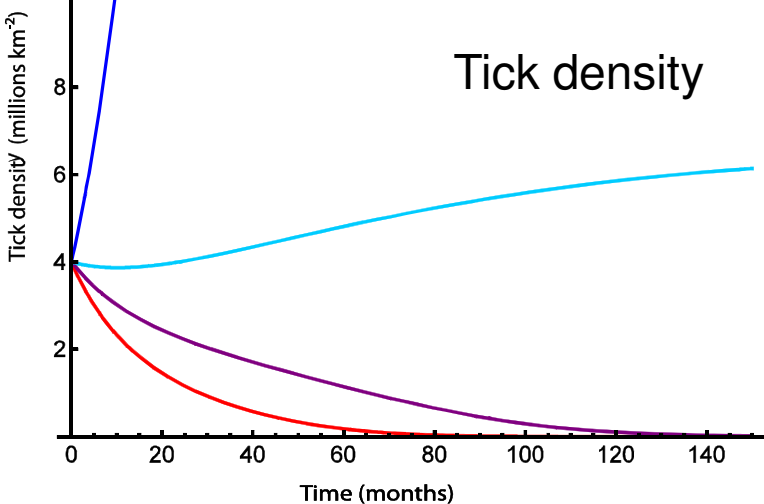
Low sheep tick burden

- 4 deer
- 6 deer
- 7 deer
- 20 deer



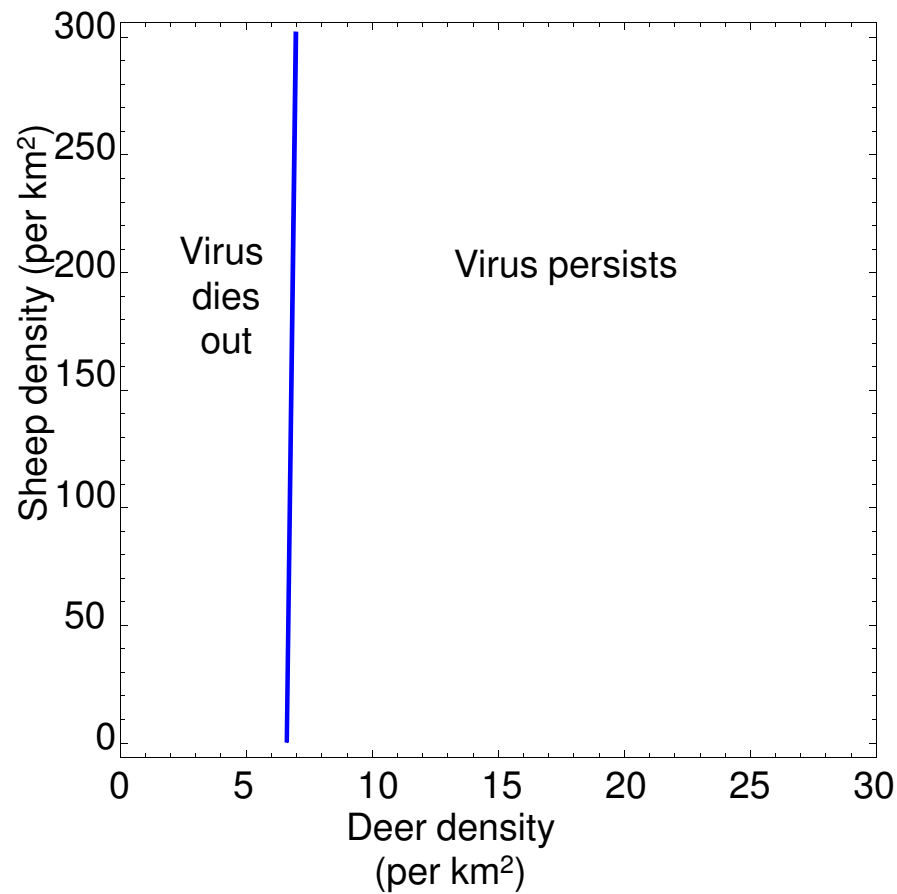
High sheep tick burden

- 7 deer
- 9 deer
- 11 deer
- 20 deer

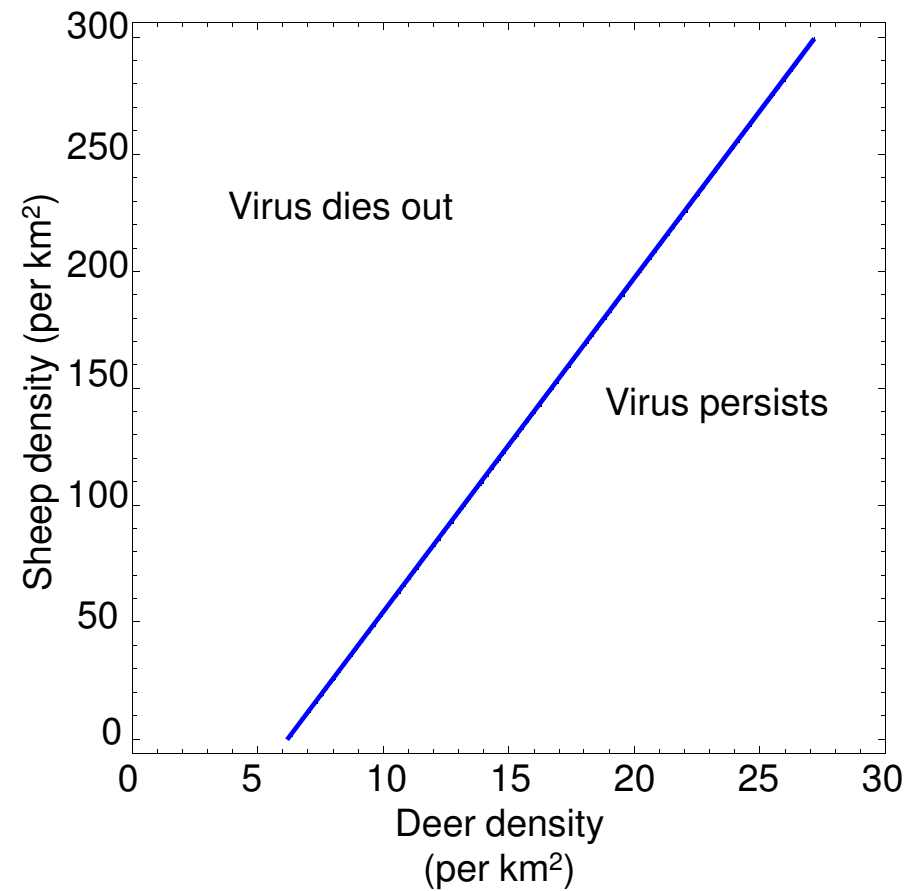


How does the sheep tick burden affect virus persistence?

low burden model



high burden model

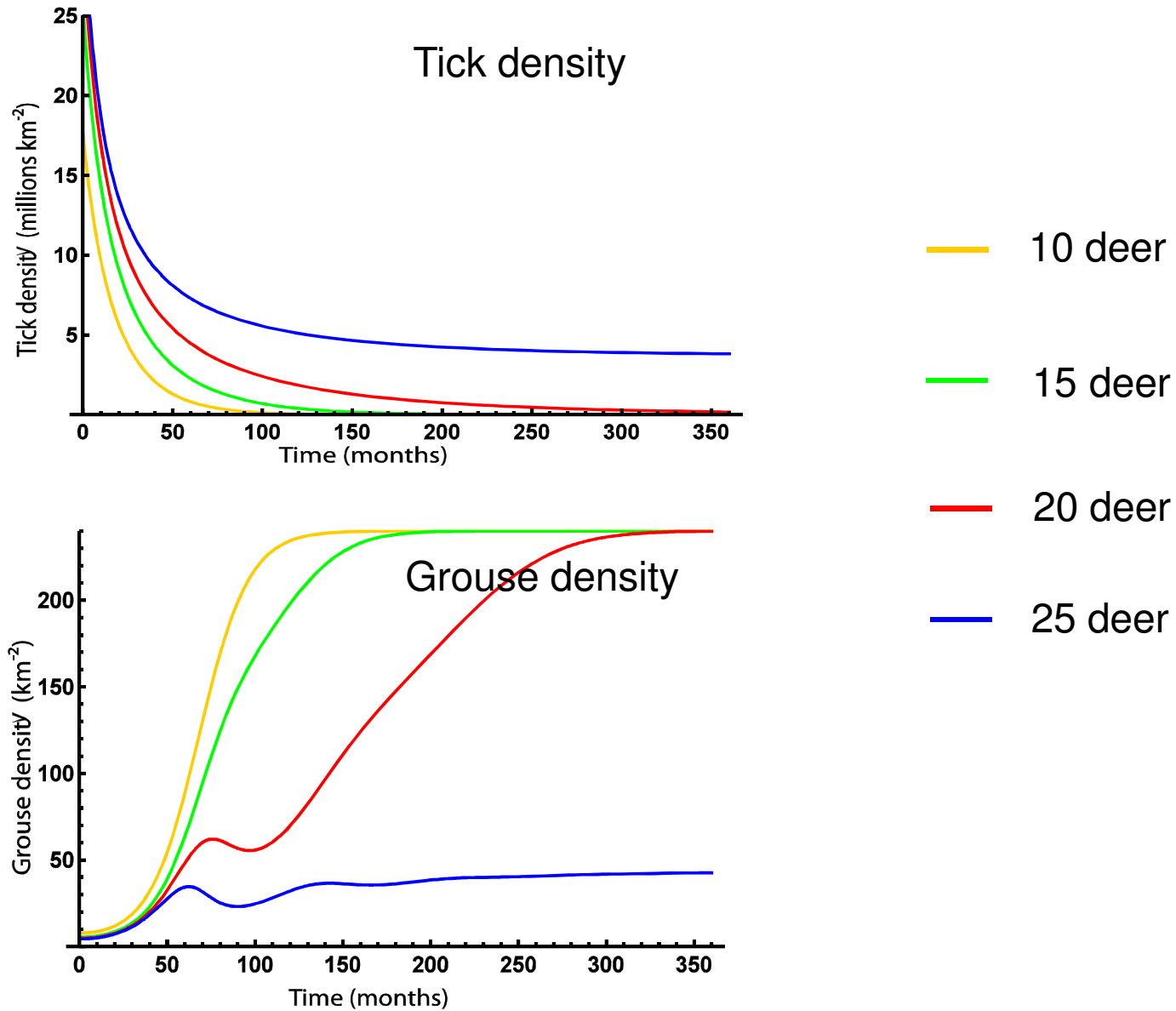


Aww!



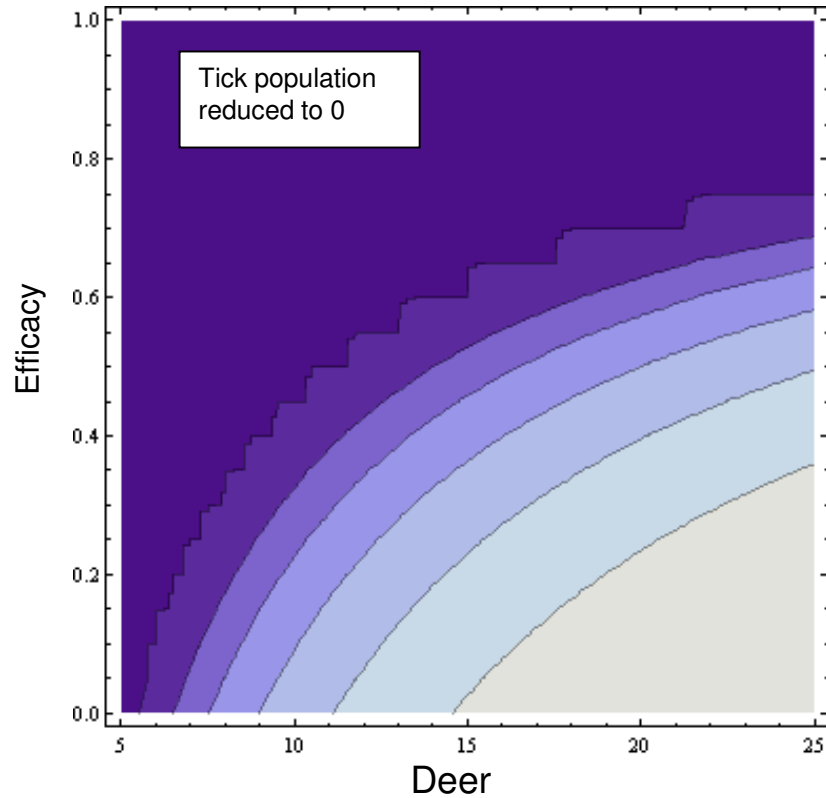
- High deer densities reduce effectiveness of sheep tick mops
- Can we treat deer instead?

What are the model predictions for adding acaricide of 70% efficacy to deer at different densities?

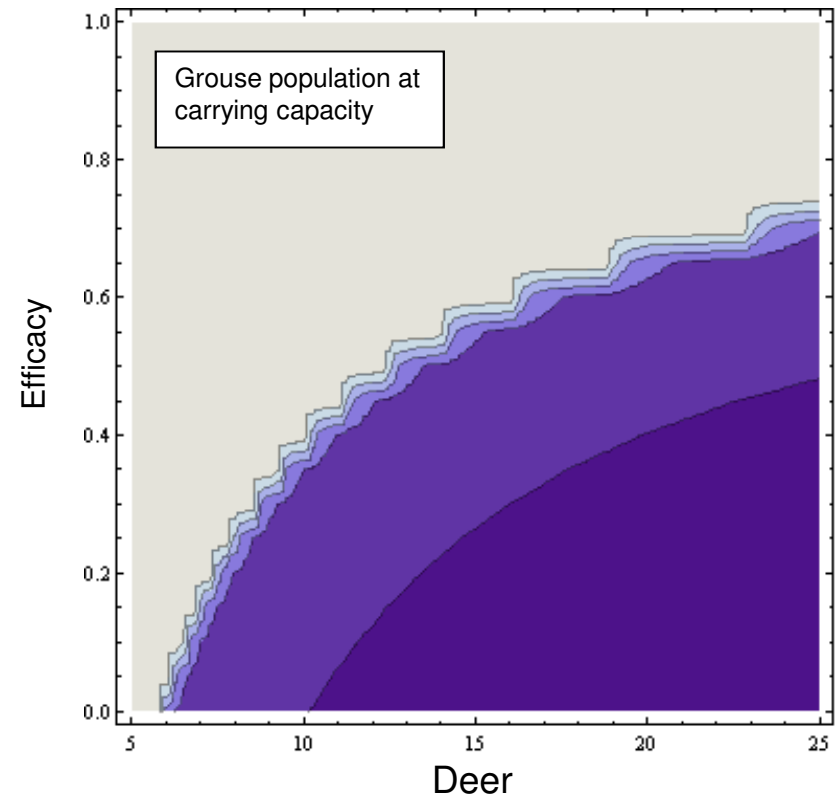


How does acaricide efficacy impact deer tick mop effectiveness?

Predicted tick population density



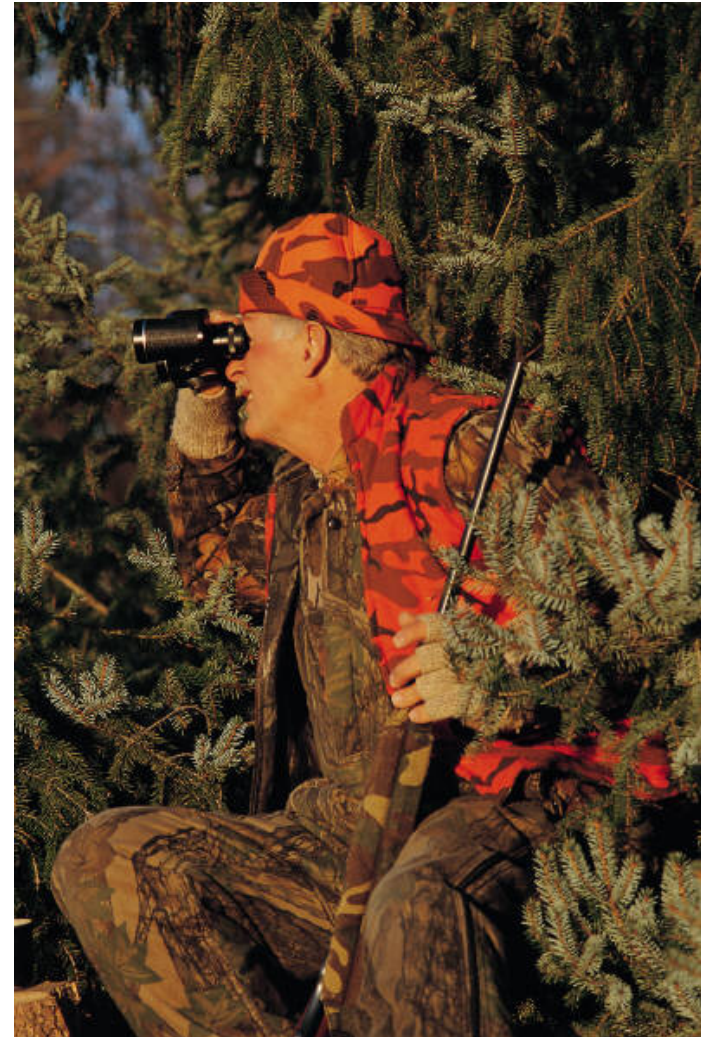
Predicted grouse population density



Deer Culling



- Legal culling occurs on many estates for habitat management tick control
- Stalking another source of income



How does culling 70% of the deer compare to acaricide treatment at 70%?

10 deer

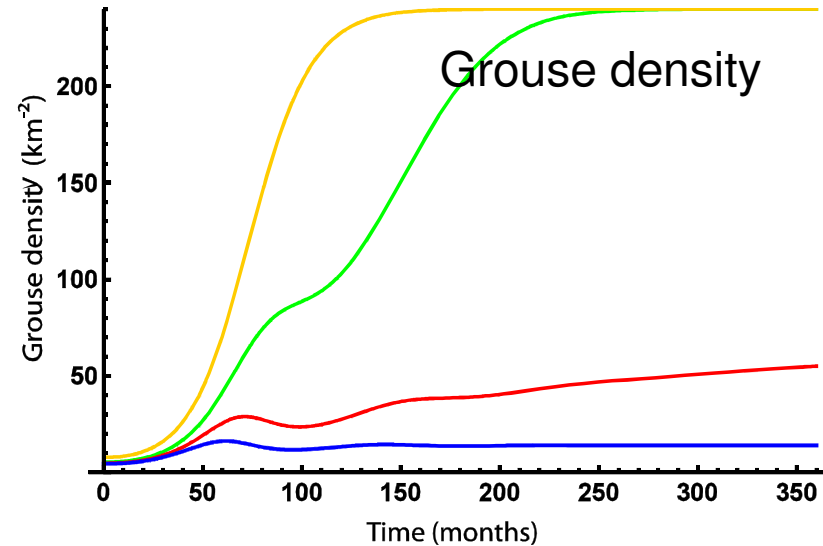
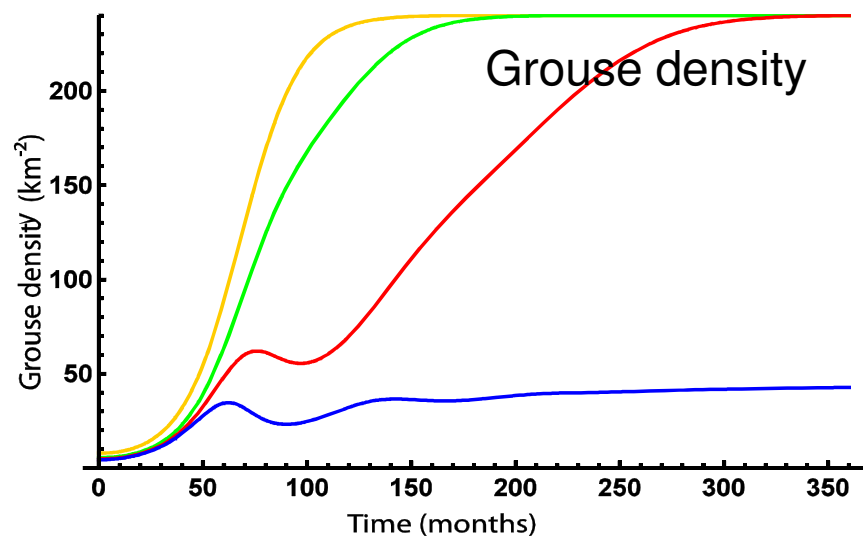
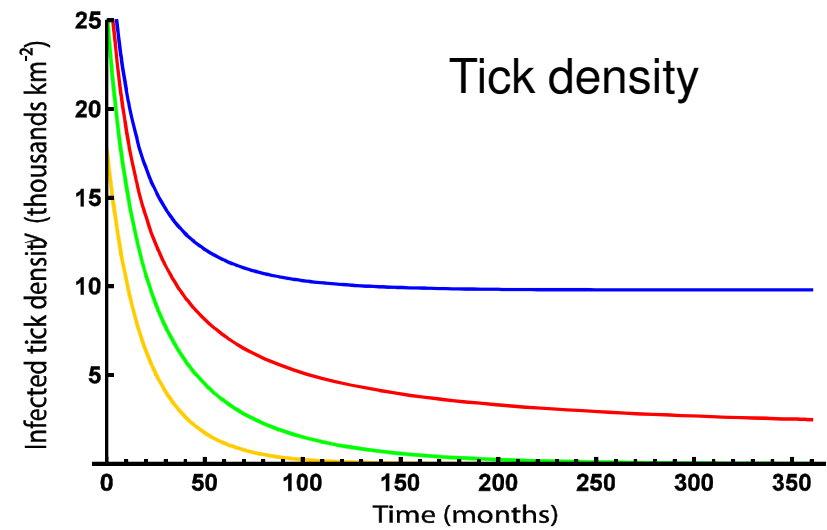
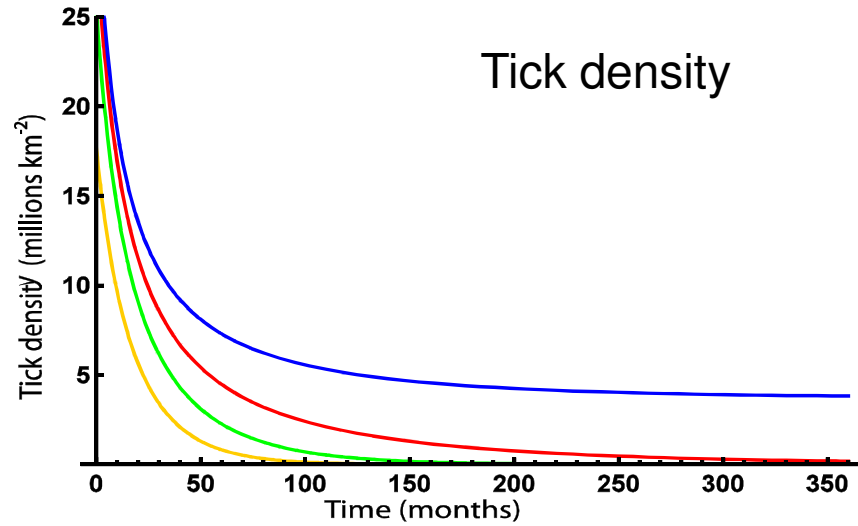
15 deer

20 deer

25 deer

Acaricide

Culling



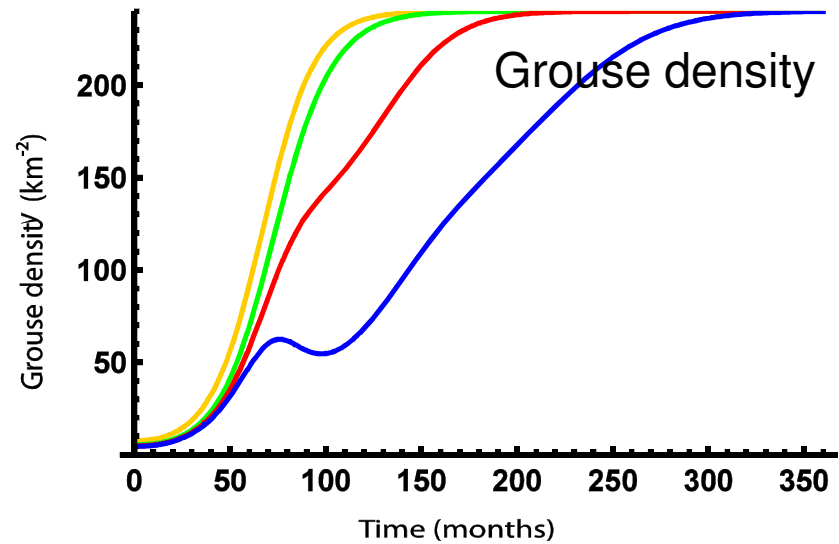
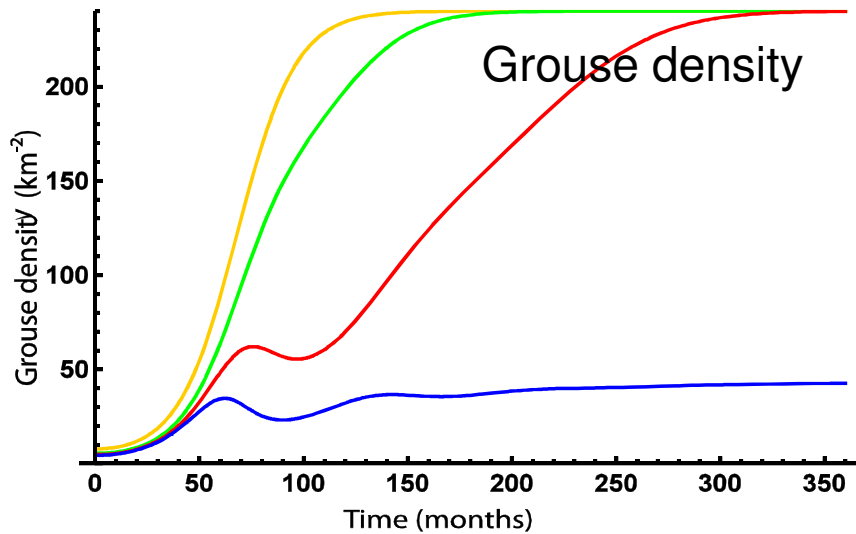
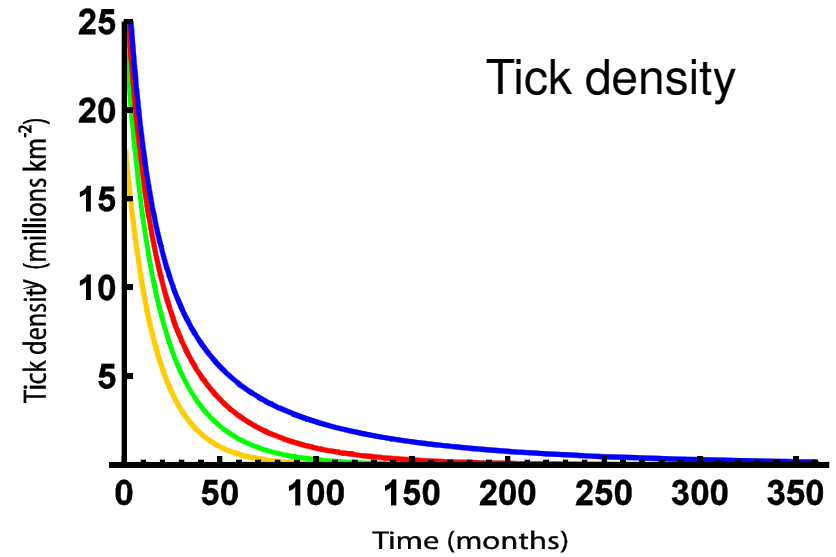
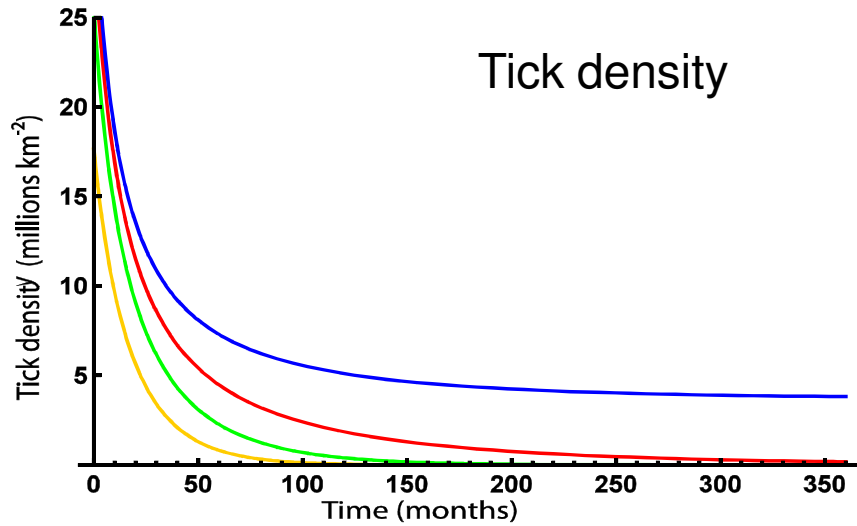
How does a combination of culling (20%) followed by 70% acaricide compare?

10 deer 15 deer

20 deer 25 deer

Acaricide only

Culling and acaricide



Conclusions

Sheep tick mops

- depend on sheep tick burden
- less effective with high deer density

Deer tick mops

- more effective with low deer density
- success improved if efficacy high
- more effective than culling
- combination may be optimum

Future Plans

- Acaricidal leg bands
- Hand in my PhD thesis!

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landowners/shepherds for data
NERC
Macaulay Development Fund



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