

Why doesn't overkill lead to extinction, given Mossiman and Martin(1975), Whittington and Dyke (1984) and Alroy (2001)?

These models ignore the impact of declining prey availability on human birth and death rates. They model human population as limited simply by land, aka carrying capacity, not by prey. So human populations reach the limit set by carrying capacity, remain at that level, and keep hunting, over generations, until there are no more animals to hunt.

In the real world, when less game is available, human birth rates decrease and death rates increase. Human populations decline, then prey populations bounce back.

These authors estimate carrying capacity based on how many modern hunter/gatherers live per square mile.

This may be useful as a hard maximum – how many herbivores and humans *at most* could be supported by a square mile.

However, and especially in a time of instability and extinctions, it's not a minimum.

Alroy's model, to be fair, reduces human birth rate when prey availability declines, but this just slows the human population growth to the same fixed carrying capacity.

Vegetation change and Clovis – Cause of extinctions or *Effect* of Boom/Bust?

The shift in vegetation (plaid to striped as per Guthrie) that is unique to the time-period is generally considered to be a *cause* of extinctions.

The model suggests, instead, that it may be an effect of the herbivore boom/bust. As herbivore populations are released from predator control, they overgraze and over browse. Proboscideans knock over trees (like elephants in Africa), creating grassland out of mixed grass/woodland.

The shift would also have reduced the amount of vegetation available for humans. That reduction, combined with herbivore boom, may have led to Clovis.

Might stressed Carnivores have become "man-eaters", and might humans then have retaliated?

In Africa, at the turn of the 19th century, when rinderpest (introduced by European cattle) killed herbivores, lions had less prey so became 'man-eaters'. (See H. Rider Haggard)

Next steps: This curve is problematical – talk to me about why.

Overkill mitigates the impact of Climate Change

Looking at it from the plants' point of view:

- Climate change stresses plants (*in this model*)
- Herbivores stress plants
- Increased killing of herbivores releases plants from stress
(*The enemy of my enemy is my friend.*)

2Op exacerbates the impact of Climate Change

2Op causes extinctions through environmental degradation during the boom portion of the boom/bust so if you add ClCh to the boom it magnifies the impact. The combination of 2Op and ClCh means extinctions occur even sooner.