

## POPULATION MODELS

# Age Structure with Management - Part 1

Tony Starfield

Recorded: March, 2011

Well at long last, we have a working elephant model. It's a model that has been calibrated. In a sense, it's now a laboratory that we're ready to use to look at management issues. How are we going to put management issues into this model?

If you think about it, we're not talking about darts yet. We're talking about preventing a proportion of the adult females from breeding. So what we're going to need to do is put in a new parameter. Let's call it 'p', which is the proportion that is prevented from breeding. And what we need to do is adjust our formula for calves to include this proportion that can't breed.

So if you were to look at any point in your column for calves, you would see that your formula there is essentially the following.

It's one-half times the total number of breeding females at time T plus 1 times the fecundity, which you remember is one 1 up on the calving interval. All we need to do is multiply that formula by 1 minus p. If p is the proportion that can't breed, 1 minus p is the proportion that can breed. Put that into the formula. Copy it right down the column, and you've now got a management option within your spreadsheet.

There's also something else we want to do, because now that we're dealing with a real population, we probably want to start off with a realistic number of elephants and a realistic age structure. And a realistic number of elephants to start off with would be 3,500. Remember at the end of the last lecture, we decided that the age structure of the elephants in the Kruger Park is probably very similar to the age structure we would have in the last row of our spreadsheet.

So what you can do is go down to that last row of your spreadsheet and look at the total number of elephants you have there. Depending on what you put in for your initial age distribution, this could be anything. So let's call capital 'T', uppercase 'T'.

What you need to do is copy that last row and then multiply it by 3,500 divided by uppercase 'T'. And then when you've done that, copy it and paste it into your time 0, your initial age distribution in your model.

And you will then be starting off with 3,500 female elephants. And the age distribution should be very similar to what we believe the age distribution is in the Kruger Park at this time.

Do that. Do those two things, and you're ready to go to do experiments in your lab. Terri's going to show you exactly how she does it on a spreadsheet now.

< 00:04:08 END >